DEC 4 1944

ENGINEERING NEWS-RECORD

NOVEMBER 30, 1944

Featuring

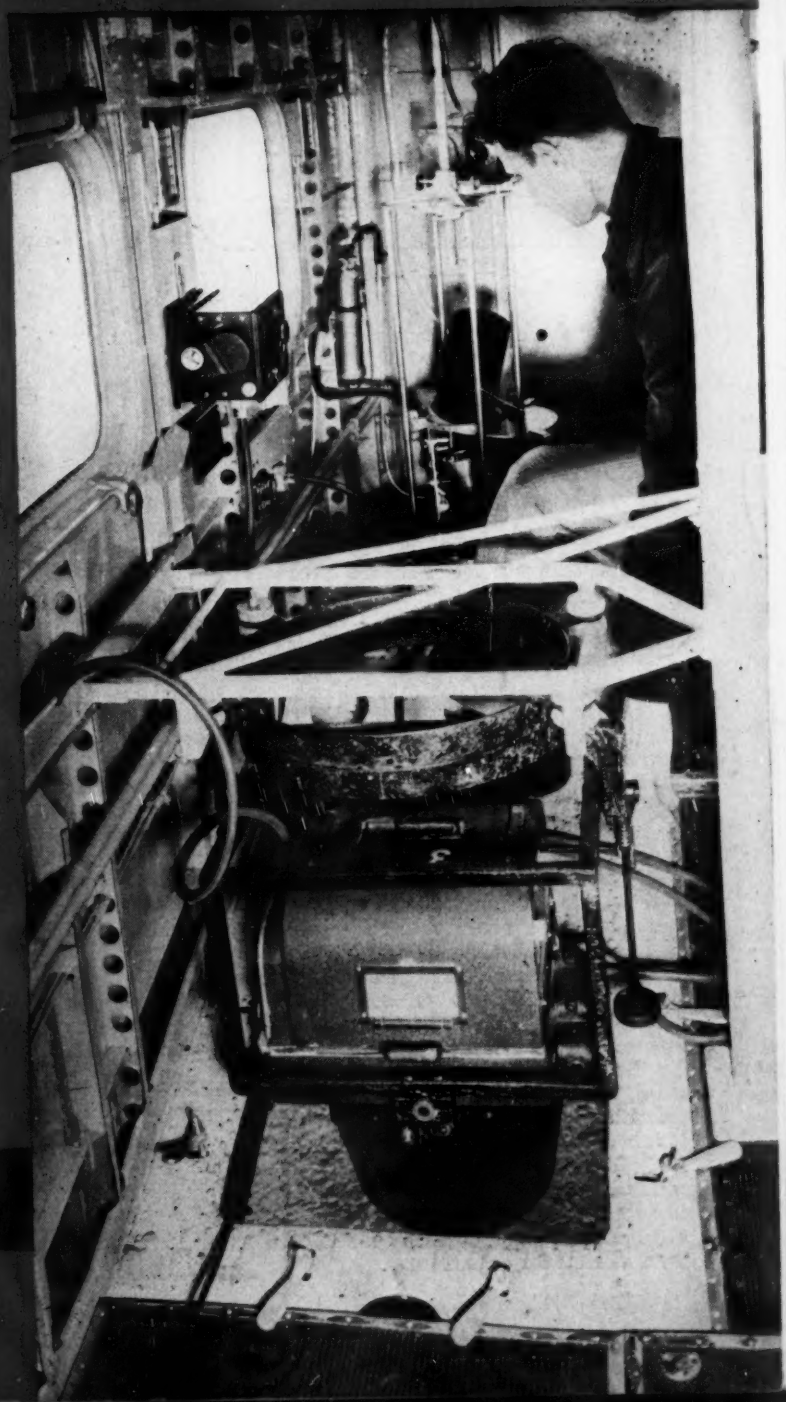
PHOTOGRAMMETRIC ENGINEERING

Also In This Issue

ENGINEER OPERATIONS IN FRANCE

FONTANA DAM CONSTRUCTION

ROOFS SUPPORTED BY AIR PRESSURE



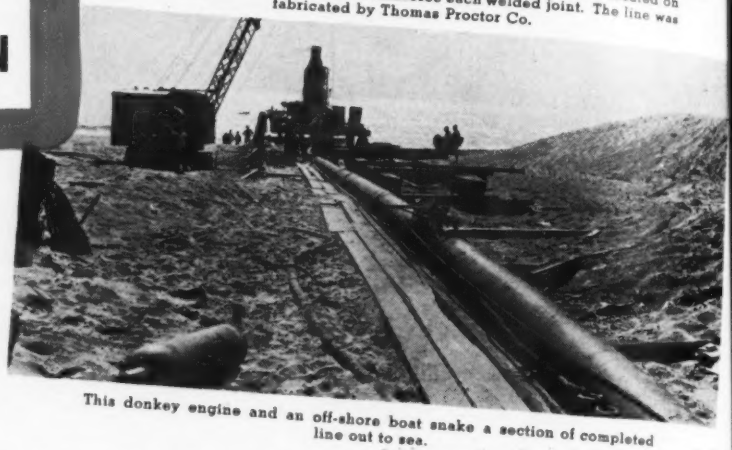
ping New Guinea jungle with a Fair-
aerial camera mounted in a flying boat
es one role of aerial photogrammetry.

Fairchild Aerial Surveys photo

Another

New Jersey OUTFALL LINE gets "Time and Tide" Protection with BYERS WROUGHT IRON

Welder attaching the "eye" for pulling the line out to sea. It is located on one of the welded sleeves which reinforce each welded joint. The line was fabricated by Thomas Proctor Co.



This donkey engine and an off-shore boat snake a section of completed line out to sea.

Manasquan, New Jersey, is one of the many communities to install a sewage outfall line . . . and also one of the many that have given proper weight to the "Time and Tide" hazards, in selecting materials. Byers Wrought Iron 12-inch extra heavy lapweld pipe was used by Mayor John L. Vogel and Municipal Engineer James Van Nuys.

Outfall lines must of course expect a double dose of corrosion, from sewage which they carry, and from the sea water which surrounds them. In addition, currents and shifting bottom may subject the line to severe mechanical strain. In some instances, long spans may be left unsupported, and only a material with well-rounded physical properties can survive.

Wrought Iron meets this unusual combination of requirements to an unusual degree. Its resistance to salt water corrosion has been demonstrated in a century of service in the marine field. Its resistance to sewage corrosion has been demonstrated in dozens of sewage treatment plants. Its resistance to stresses and strains is demonstrated by the very method of installation used. Only a strong, ductile material could stand the punishment involved in "snaking" a thousand feet of line out into the ocean. Engineering opinion of the material is indicated by the fact that 10 communities in New Jersey alone have used it for outfall lines.

The unusual nature of wrought iron is responsible for its service qualities. Tiny fibers of glass-like silicate slag are threaded through the body of high-purity iron, giving a structure like that of a stranded wire cable which can absorb severe physical punishment. And the fibers help to halt and deflect corrosive attack, and anchor the initial protective film that shields the underlying metal.

Our bulletin, "Wrought Iron for Sewage Treatment and Disposal Installations," will give you some helpful facts. Ask for a copy.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.

A section of the complete line in its trench on the beach. Backfilling will complete job.

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ENGINEERING NEWS-RECORD

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JOHN ABBINK, *Publisher*

WALDO G. BOWMAN, *Editor* ALBERT E. PAXTON, *Manager*

...ol. 133 NOVEMBER 30, 1944 No. 22

...COMING NEXT

• The creation of a Missouri Valley ...uthority, patterned after TVA, to ...ontrol development of the Missouri ...River Basin is likely to be one of the ...ig controversial issues of the forth...oming 79th Congress. A co-or...linated plan just completed by the ...Corps of Engineers and the Bureau ...of Reclamation, and now ready for ...ubmission to the Congress, is there...fore of vital importance to an under...standing of the problems involved. ...The plan will be published in our ...Dec. 14 issue.

• To permit open-pit mining of iron ...ore found at the bottom of a 100 to ...300-ft. deep lake in Canada required ...the diversion of a river to a new ...course; emptying the lake by pump...ing; and the stripping of millions of ...cubic yards of overburden from the ...lake bottom. At least one construc...tion innovation was introduced—the ...use of a tunnel on the flow line of ...the open diversion channel, for the ...purpose of relieving in rock blasting. ...The scheme required only half the ...usual amount of explosives and re...sulted in better fragmentation. The ...project will be described in the Dec. ...14 issue.

• The recent decision of the Illinois ...Supreme Court declaring the State ...engineer license law unconstitutional ...is of far reaching importance to engi...neers in other states having license ...or registration laws because most of ...those laws have similar, if not iden...tical, wording in many sections. The ...court held that the act was so lacking ...in definiteness as to what constitutes ...the practice of professional engineer...ing as to be unenforceable and in...equitable. The court's decision will ...be reviewed in *ENR*, Dec. 14, issue.

...LOOKING AHEAD

• For boldness, both in conception ...and execution, the construction of ...artificial harbors on the invasion ...beaches of Normandy constitutes one ...of the great engineering feats of our ...day. The Navy has prepared an au...thoritative article relating the story ...of the American installation for early ...publication in *ENR*. Although this ...installation was destroyed by an un...precedented storm, its tragic fate ...does not detract from the engineer...ing achievement represented by its ...construction.

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Atlas Duraplastic cement has been used for paving since 1939. Each year has shown an increase both in the number and types of installations and in the number of engineers and contractors who have specified and used Duraplastic. Today these installations total over 2½ million sq. yds. of highly scale-resistant paving.

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Write for further information on the use of Duraplastic, the cement that makes concrete more durable and more plastic. Ask for reprints of articles from technical journals giving details of actual installations.

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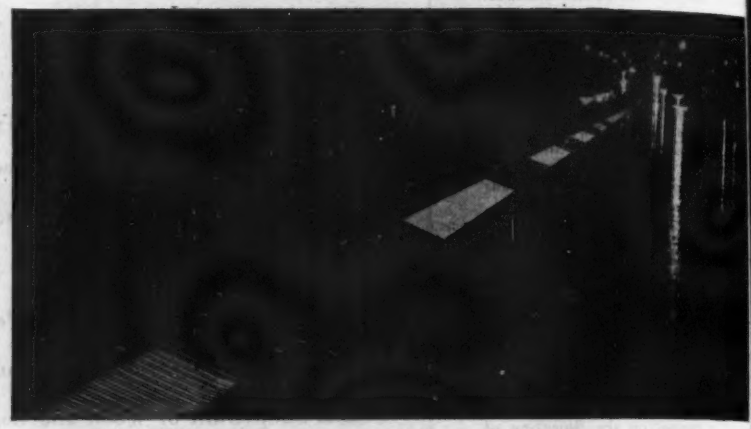
ENR-CD-6

White Concrete Reflecting Curb made with Atlas *White* Cement Provides a White Guide to Safety



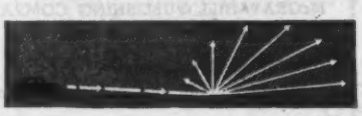
Rainy night view of alternate sections of smooth white concrete curb and scored-finish reflecting white concrete curb. Note how effectively reflecting curb defines the direction of the road far ahead of the car.

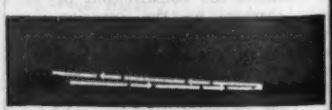
FOR normal night driving the only effective source of light is the driver's headlamps, and his guide to safety is the road's edge. Curb defines the road's edge but does so effectively only when it is highly visible. It is visible at night only when it reflects light and then only when it reflects that light in the right direction; namely, back to the driver.

White Concrete Reflecting Curb, made with Atlas White cement, is highly visible at night because it meets the two requirements for visibility: (a) its light color makes it a *good reflector;* and (b) its saw-tooth faces reflect the headlamp rays in the *proper direction*—that is, back to the driver. The illustrations below show why.

Before planning new highways or improving present ones, write to our Atlas White bureau for your copy of the book, "A White Guide to Safety." It shows how to design, make and install White Concrete Reflecting Curb.

A smooth curb (left) wastes light . . . reflects it up and away from the driver. A White Concrete Reflecting Curb (right) conserves light . . . reflects it back to the driver. A smooth curb is barely visible at night; a White Concrete Reflecting Curb stands out—bright and clear.





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The Week In Engineering and Construction

ENGINEERING NEWS-RECORD • NOVEMBER 30, 1944 • VOLUME 133 • NUMBER 22

House passes highway bill providing $1.5 billion

Authorizes $500,000,000 yearly for three years and permits use of federal funds for right-of-way purchases. Flight strip aid limited to 3 percent of funds.

After nearly six months of delay, last Wednesday the House of Representatives passed a bill providing federal funds for highway construction in the postwar period. The bill, (H.R. 4915) authorizes a total of one and one-half billion dollars for federal aid for highway work in the first three postwar years.

The original bill was reported out by the House Roads Committee on June 2 (*ENR* June 8, 1944, vol. p. 847). It called for the same amount of federal aid money, but the measure, as amended differs widely from the original recommendation. The new version also differs somewhat from the bill (S. 2105) passed by the Senate on Sept. 15, (*ENR* Sept. 21, 1944, vol. p. 333).

House provides more than Senate

Annual allotments for the first three postwar years by the house bill are as follows: $225,000,000 for projects on the federal aid primary highway system, $150,000,000 for work on secondary roads, and $125,000,000 for projects on the federal aid primary system in urban areas of over 5,000 population.

Corresponding totals in the bill passed by the Senate are: $200,000,000, $125,000,000, and $125,000,000, which makes Senate bill total $450,000,000.

The House and Senate bills contain identical authorizations for special highway programs. For each of the first three postwar years these allotments are: for forest highways, $25,000,000; for forest roads and trails, $12,500,000; for roads and trails in national parks, $4,250,000; and for access parkways to national park areas, $5,000,000.

The method of matching funds outlined by the House Bill permits the federal government to contribute 50 percent of the cost of the work for all three years. This method is in agreement with the Senate Bill as passed. The original Senate Bill had provided that the federal government pay 60 percent in the first postwar year.

Apportionment in the original House bill was to be based as follows: one-half on population, one-fourth on area, one-fourth on post-road mileage. But in the amended bill this method of apportionment was replaced with that proposed in the Senate measure.

Small cities get their share

With this method of distribution, funds for work on the federal aid primary system will be apportioned on the old basis of one-third on *total* population, one-third on total post-road mileage, and one-third on area. Aid for projects on secondary and feeder roads will be made available on the basis of one-third on *rural* population, one-third on post-road mileage, and one-third on area. Money for projects in cities of over 5,000 population would be distributed to the various states in the ratio that the population of cities of 5,000 or over in a particular state bears to the total population of all such cities in the country. Each state, of course, could distribute these city funds as it sees fit, so long as it is spent for projects of the type originally planned. This method of apportioning funds for urban work also differs materially from that originally proposed, and it permits a more equitable, yet flexible, distribution.

The House bill is also modified to limit, in a given year, expenditures for railroad-highway grade crossings by any state to 15 percent of the total federal aid to that state. The House does not require the railroad benefited to contribute any part of the cost on such work, although the Senate requires the railroad to pay 15 percent of the cost of these projects; the Senate requirement was looked upon by the House as a possible cause of delay to some grade separation construction.

Use of federal funds for flight strip construction by a given state was limited by the House to three percent of the total federal allotment in a given year to that state. This restriction is not included in the Senate bill.

An important feature still retained by the House bill and not allowed by the Senate is that a state may spend federal aid funds for purchase of necessary rights-of-way. This provision was

(*Continued on next page*)

A.S.C.E. to expand postwar activities

Activities of the American Society of Civil Engineers in stimulating postwar construction are to be expanded through a cooperative arrangement just entered into with the Committee for Economic Development. Malcolm Pirnie, president of the A.S.C.E., has been named chairman of an Action and Advisory Committee which the C.E.D. has set up to stimulate the preparation of postwar construction programs at community level. Members of the A.S.C.E. Committee on Postwar Construction will also serve on the committee.

Local cooperation in the community activities is to be carried on chiefly through the development of closer relations between the local sections of the A.S.C.E. and the 2,100 community chairmen of C.E.D.

Chairman of the local section committees on postwar construction will serve as advisors to the executive committees of the C.E.D. community organization.

G. Donald Kennedy, chairman of the A.S.C.E. Committee on Postwar Construction, for some months has been actively promoting closer cooperation between the A.S.C.E. local sections and community committees of the C.E.D. as a desirable means for facilitating the work of both groups in stimulating definite plans for postwar operations. The new setup is expected to go far toward meeting his hopes.

stricken from the Senate bill because of the claim that it would be more costly to purchase rights-of-way if the landowner knew federal funds could be used for this purpose.

Differences between final House and Senate bills will be adjusted by a joint committee representing the two branches of Congress. No long delay is expected in this work, since Congress desires to recess by December 15 and is anxious to complete the highway legislation at this session. Once details are worked out by the two branches, the compromise bill should soon become a law.

Money in 1945

Three important amendments were offered in the closing debates but only one accepted tentatively up to the end of the session Tuesday. The favored amendment would permit federal appropriations to start in the fiscal year, 1946, (starting July 1, 1945), or as otherwise directed by Congress. The original bill specified "postwar fiscal years". Amendments were proposed but defeated (1) to increase the total amount under the bill to $1,800,000,000 and (2) to spread the $1,500,000,000 over a five instead of a three-year period.

• • •

Stewart & Co. optimistic starting 2nd century

A postwar construction boom for at least five years, with every indication that peacetime construction will surpass the highs of the war emergency program, was forecast by Harry D. Watts, chairman of the board of James Stewart & Co., Inc., internationally known builders. The Stewart organization this month completes 100 years in the construction business and in the past three years has participated in construction of over $250,000,000 worth of war plants.

If Washington adopts a "hands off" policy the Stewart company expects the construction industry to have a great deal of private work to do in preparation of plants for manufacturing. Many of the war plants will not be found suitable for conversion to civil use and some were built for only five years life and will require replacement.

The Stewart firm does not expect that American engineers and construction men will find much work abroad until local firms have proved inadequate for the rehabilitation task and American constructors are not expected to be immediately welcomed in the Eastern hemisphere. Stewart has some very active plans for South America, however, including both steel and concrete structures of considerable magnitude.

Large postwar program for State of Washington

Public works programs totaling more than $200,000,000 are planned in the state of Washington for after the war, according to figures compiled by the State Planning Council.

The largest program will be by the state itself, with the state highway department planning projects costing $80,000,000 for the three years immediately following the war. Cities, counties and school districts have proposed projects to cost an additional $131,000,000.

The state highway department has plans for its program about 30 percent complete, according to Director Burwell Bantz, but few of the city-county-school board projects are yet in the blueprint stage.

In the Seattle area, the city has proposed projects costing $36,030,190; King County, $37,072,500; and various school districts, $12,793,000. Seattle expects to have about $7,000,000 available for such a program at the end of next year, without issuing any bonds or levying additional taxes.

Tacoma prepared for a postwar program by voting two bond issues totaling $5,500,000 at the November election. The city will vote on a $3,500,000 issue and the school district on a $2,000,000 issue. This program follows the proposal of Col. E. P. Antonovich, U. S. Army retired, as coordinator of all Tacoma postwar projects. Of the city bond issue, $500,000 will be for street improvements and $3,000,000 for sewer improvements. The city of Bellingham has retained Joshua Vogel of Seattle to make a study of the city's needs for the future.

• • •

Big Escanaba ore dock is being dismantled

Dismantling of one of the two unfinished giant ore docks at Escanaba, Mich., on which the government began construction in August, 1943, at a cost of approximately $14,000,000, is now in progress. The heavy timbers above the piling of the No. 3 dock are being sawn into lumber for use in constructing an ordnance plant at Merrimac, Wis. Work will be completed about Dec. 15 under a contract awarded by the Corps of Engineers.

The No. 3 dock was begun as part of an alternate route for upper Lake Superior district iron ore, in case the government canal and locks at Saulte Ste. Marie, Mich., should be put out of commission by enemy action. The other government dock, No. 1, was completed except for installation of steel tracks, chutes, and other steel equipment, and is not being disturbed at present.

The War Production Board, about April 1, 1943, ordered work on No. 3 dock halted, and work on No. 1 was within 60 days of completion when construction was stopped. Shortage of cross-ties and structural timber as well as elimination of the threat to the Soo locks was given as reasons for the stoppage.

Merritt, Chapman & Scott, were contractors on the project.

• • •

To resume home building in Philadelphia, Pa.

It is reported that $10,000,000 worth of private home building will be started in the Philadelphia metropolitan area in the spring of 1945, the first such new construction there since 1941.

Leo A. Kirk, federal housing representative there told the Home Builders Association that present government plans call for permission to build 1,500 private homes in that area with a tentative ceiling price of $8,000 each.

• • •

Aviation amendment passed in Minnesota

An amendment to the state constitution of Minnesota authorizing the state to construct, maintain and operate airports and other air navigation facilities was passed at the recent election by a vote of 737,091 to 264,149. Opponents of the amendment claimed that it provides for special forms of taxation and takes from the cities a source of badly needed revenue, since municipalities and counties have been collecting personal property and real estate taxes on planes and landing fields.

• • •

Earth shock at Shasta due to water pressure

A sharp earth shock recorded in the vicinity of Shasta Dam, near Redding, Calif., in mid-November is believed to have been caused by the settling of the bottom of Shasta Lake under the pressure of stored water, according to Ralph Lowry, construction engineer. Such disturbances were prevalent in the Boulder Dam area when Lake Mead was being filled, he reported, as the earth was compressed by tons of water pressure.

Water stored behind Shasta Dam has been rising as the result of recent rainfall, though the record 901-ft. elevation of June has not yet been reached.

President's recommendations call for action on planning funds and MVA

Congress is asked to appropriate $76 million to implement state and local works plans. Creation of MVA is also urged

Focusing attention on two important measures related to engineering activity, President Roosevelt made two recommendations to the Congress on Nov. 28. One of these called for the appropriation of $76 million for the stimulation of postwar public works planning by state, county and municipal agencies. The other recommendation, wholly unrelated to the first, asked for authorization of a Missouri River basin development plan to be supervised by a Missouri Valley Authority.

Loans for planning

In requesting a fund of $75,900,000 for non-federal public works planning the President acted in accordance with the provisions of Title V of the George Bill for War Mobilization and Reconversion. The fund would provide loans up to 5 percent of the total cost of projects, this money to be used for financing the cost of engineering surveys, designs and other procedures preparatory to actual construction.

The loans, which are non-interest-bearing, would be made available for state and local government agencies and must be repaid when projects go into construction. The federal works agency, would allot the loan funds among the states in accordance with this formula: 90 percent in the proportion to which the population of each state bears to the total population of the country, and 10 percent at the discretion of the FWA administrator. In no case will the funds for any state be less than one-half of one percent of the total funds available.

The states, in turn, will distribute the loan funds among local agencies.

MVA coordination

With the request that Missouri River basin plans be developed and supervised by a Missouri Valley Authority, the President also transmitted the joint proposals of the Bureau of Reclamation and the Corps of Engineers for the Missouri watershed development. The proposal reconciles divergent points of view and sets forth basic principles of agreement reached by the two agencies as to jurisdiction and objectives.

Three major points

The three major points in the proposal are:

1. The Corps of Engineers should determine reservoir capacities for flood control and navigation.

2. The Bureau of Reclamation should determine reservoir capacities for irrigation, the probable extent of future irrigation, and the amount of stream depletion due to irrigation development.

3. Both agencies recognize the importance of the fullest development of hydroelectric power in the basin consistent with the other beneficial uses of water.

• • •

Postwar slum clearance planned for Hartford

Hartford, Conn., has plans for a postwar slum clearance project involving construction of 2-story brick garden apartment buildings to cost about $10,000,000. The Communities Redevelopment Corp. of New York, an organization of five contracting companies, has made preliminary studies and is working with the Hartford Housing Authority on the proposed development.

It is planned to have the Hartford Housing Authority issue bonds for the cost of acquiring slum properties through the newly established corporation. The Communities Redevelopment Corp. would sell bonds to finance construction. The Hartford Housing Authority would lease the land to the corporation for 99 years. The Redevelopment Corp. would pay 15 percent of construction cost, and after completion the Hartford Housing Authority would purchase the properties at cost plus 5 percent.

During a 30 years period the Hartford Housing Authority would be required to pay the city an amount equal to the taxes now being received from the properties.

• • •

San Francisco harbor improvement proposed

Anticipating an increase in shipping to and from San Francisco above prewar levels, the California State Harbor Commission recently outlined a $3,227,000 program to expand and improve San Francisco harbor facilities.

Plans include the building of a 1,000-ft. wharf at the end of Pier 50 and new key piers around Mission Rock.

Signal Corps photo

Transportation Corps saves vital war lumber

Used lumber valued at more than $1,000,000 has been reclaimed in the past three months by the Transportation Corps, Army Service Forces.

Operated principally by Italian Service Units and German prisoners of war, at the Transportation Corps ports of embarkation and other installations, the salvage program has mushroomed from a routine job to a conservation effort increasingly vital to wartime shipping.

Every type of lumber, from bomb racks and bulkheads of freight cars to dunnage, goes into the woodpile at port salvage yards where it is checked, sawed, sorted and shipped to points where needed for reuse.

Lieut. Gen. R. A. Wheeler Gets Stilwell post

Lieut. Gen. Raymond A. Wheeler of the U. S. Army Engineers has been designated deputy supreme Allied commander under Lord Louis Mountbatten in the southeast Asia command. His previous assignment as principal administrative officer for the Allied command will not be affected.

The old American, China-Burma-India theater has been divided into the China theater and the Burma-India theater, thereby eliminating General Joseph W. Stillwell's former title of commander, U. S. Army Forces, CBI. Taking over General Stilwell's duties are Lt. Gen. Daniel I. Sultan, another engineer officer, as commanding general, U. S. Army Forces in the India-Burma theater, and Maj. Gen. Albert C. Wedemeyer, commanding U. S. forces in China.

Signal Corp photo

Lieut. Gen. R. A. Wheeler

Lt. Gen. Wheeler assumes his new responsibility in Mountbatten's headquarters in Kandy, Ceylon.

Since the war began Gen. Wheeler has had extremely important duties. In September, 1941, he was assigned to the office of the chief of staff in Washington to serve as acting assistant chief of staff, supply division, G-4. A little over a year later he was assigned to the Army group, Washington, and went overseas with the U. S.-Iranian military mission, leaving this assignment in March, 1942 to command the headquarters, service of supply for the China-Burma-India theater of operations. In November, 1943 he was made principal administrative officer for the CBI theater, still his principal asignment.

Before the war Gen. Wheeler held many important positions with the Corps of Engineers on peacetime operations. He has served as district engineer at Newport, R. I., at Wilmington, N. C., and at Rock Island, Ill. Gen. Wheeler also served as: assistant engineer commissioner of The District of Columbia, assistant engineer of maintenance on The Panama Canal, chief regional engineer for the Works Progress Administration at Chicago, resident member of the board of engineers, Washington, D. C., and engineer of maintenance of The Panama Canal.

General Wheeler is a graduate of West Point, the engineer school, the command and general staff school, and the Army War College at Washington, D. C.

• • •

Twelve Army engineers receive promotions

Included in the 97 general officer nominations sent to the Senate last week by President Roosevelt were twelve members of the Corps of Engineers, U. S. Army. Maj. Gen. Wilhelm D. Styer, since May 1943 chief of staff and deputy to the commanding general of the Army Service Forces, was the only officer recommended for advancement from major general to lieutenant general. Styer, a graduate of West Point, for four years was district engineer at Pittsburgh for the Corps of Engineers and once served as consulting field engineer for the Works Projects Administration at the Columbus, Ohio, office.

Those promoted from the rank of brigadier general to major general included: Harry B. Vaughan, commanding general, Services of Supply, western base section, European theater of operations, and Royal B. Lord, deputy chief of staff, European theater of operations.

Nine engineer officers were among those promoted from colonel to brigadier generals. These men were: Francis K. Newcomer, engineer of maintenance, The Panama Canal; Roy W. Grower, engineer, Britanny base section, communications zone, European theater of operations, U. S. Army; Lewis T. Ross, chief engineer, Services of Supply, southwest Pacific area; Rudolph C. Kuldell, assistant chief of engineers for military supply; Robert B. Neyland, Jr., commanding general S.O.S. base section and port of Calcutta.

Others to be listed in this rank whose present assignments cannot be identified because of military reasons are as follows: Herbert B. Loper, Bruce C. Clarke, James C. Marshall, and Samuel D. Sturgis, Jr.

Huge stadium proposed for Washington, D. C.

If the plan backed by a large number of influential government officials, business executives, townspeople and sport fans is fulfilled, a stadium of sufficient capacity to accommodate crowds of the size attending the Army-Navy football games will be built in Washington, D. C. Strong support for the plan has developed and it is being urged that the work be started as soon as priorities will permit. It is hoped that the structure can be completed in time for the Olympic Games which are scheduled for 1948.

The proposed structure would seat 100,000 spectators. It would be built at the foot of East Capitol St. on the bank of the Anacostia River near the National Guard Armory. Cost of the work is estimated at $3,500,000. Already several different schemes have been reviewed by the National Capital Park and Planning Commission, although the most satisfactory design has not yet been decided upon.

Bills which would establish the necessary machinery for constructing the stadium have been introduced in both branches of congress. President Roosevelt is said to have approved the project.

• • •

Engineers recommend rebuilding Ohio Canal

At a recent meeting of the Regional Planning Association at Toledo, Ohio, complete rebuilding of the Ohio Canal was urged by B. J. Cleavenger and S. O. Kugel, engineers of the Ohio Public Works Department, as the first step in the city of Akron's rat control campaign. They estimated that the project would cost $3,000,000. The canal would have to be almost entirely rebuilt, they said, because it was destroyed in the 1913 flood and has never been repaired correctly.

They revealed that 31 million gpd. of water, equalling the amount pumped by the city-owned system at Lake Rockwell, are taken from the canal for Akron's booming war plants. This water is added to the 700 million gpd. released by the state from Nimisila Dam.

Cleavenger also criticized the city council for permitting 28 sewers to be hooked to the canal between W. Exchange St. and Waterloo Rd. He said that while the method may be inexpensive, it "makes an open sewer 50 to a 100 ft. wide running through the center of the city."

MEN AND JOBS

Robert G. Sarvis was recently appointed public works director for Cincinnati, Ohio, by City Manager Wilbur J. Kellogg. A 1922 graduate in civil engineering from the University of Cincinnati, Mr. Sarvis was formerly a partner in the contracting firm of Mc-Kane and Sarvis. He was later employed by the WPA as specifications engineer and custodian of property of a district comprising 15 southern Ohio counties. Later he served as a deputy county engineer in charge of the county's construction and highway maintenance work as well as its traffic and safety problems.

Charles T. Hinze, engineer in charge of the Bureau of Reclamation office at Bismark, N. D., has been transferred to the district office in Billings, Mont., where he will be assistant chief of project planning. This district comprises eight states in the Missouri River basin. He will be succeeded at Bismark by **Bruce Johnson,** assistant engineer with the Bureau.

Carleton Sharpe is the new city manager of St. Petersburg, Fla. He has appointed **Raymond Ridgely,** former manager, as director of public works, succeeding **H. R. Topping,** who becomes superintendent of streets.

F. J. Russell has been appointed acting engineer of maintenance for the state of Mississippi, succeeding **A. J. Yates,** who resigned to go with the construction firm of W. G. Cook.

Mr. Russell has been with the Mississippi State Highway Department since 1919, acting as a project engineer on the first federal aid project in Mississippi. He served for nine years as district engineer before being promoted to assistant engineer of maintenance in 1930. He was graduated from Mississippi State College and received specialized training at the Georgia School of Technology.

Maj. Gen. John Peter Mackenzie, Vancouver, B. C., formerly general manager of the Hamilton Bridge plant at Vancouver, has been appointed dominion construction controller at Ottawa. He succeeds **John Schofield,** Montreal, who has resigned to resume his position as chief architect for the Canadian National Railways. General Mackenzie served with the Canadian Army in the first World War and was recalled to the forces at the outbreak of the present war. On reaching the retirement age in June, he joined the Munitions and Supply Department at Ottawa.

Max A. Krasnick, formerly with Jerome A. Utley, general contractor of Detroit, Mich., has been assigned as resident engineer on part of the Caracas, Venezuela, water supply project by the consulting engineers, Parsons, Brinckerhoff, Hogan and MacDonald, New York.

Harold B. Bursley, Charlotte, N. C., civil engineer, has been retained to do the landscaping and engineering work for a $300,000 city park of 110 acres for Charlotte. Mr. Bursley recently served as principal designing engineer for Greenbelt, Md.

Roy L. Clark, regional chief of the technical service of the Smaller War Plants Corp., has resigned to return to the firm of Nemmers & Clark, consulting engineers, Des Moines, Ia.

W. Guy Ancell, who recently resigned as city manager of Hopewell, Va., has accepted the city managership of Covington, Va. He was town manager of Orange, Va., before going to Hopewell.

O. W. Crowley has returned to his former position of executive secretary of the Central Branch, Associated General Contractors of America, at Des Moines, Ia., after 30 months in Alaska. He has been project manager for Lytle & Green Co., managing contractors for the Alaska section of the Alcan Highway. During the past season he also has been in charge of several airport jobs in Alaska.

The George J. Atwell Foundation Corp., of 45 Rockefeller Plaza, New York, has announced the election of **George J. Atwell, Jr.,** former vice-president, as president of the organization.

Maj. E. H. Rausch, Jr., has been appointed head of supply activities for the Seattle District, U. S. Army Engineers, to succeed **Lt. Col. James M. Wild,** transferred to the Pacific engineer division headquarters at San Francisco, Calif., Graduated from the University of Iowa in civil engineering, he joined the Army engineers as a civilian engineer on river and canal projects in the Rock Island, Ill., district in 1933. He was transferred to Seattle in 1940 as a civilian engineer on Alaskan construction assignments and was called to active duty in 1942 to serve as head of the Alaska division of the Seattle office. **Capt. Douglas M. Pelton** succeeds Major Rausch as head of the Alaskan division.

Capt. William T. Pascoe III, former assistant chief engineer of the Levingston Shipbuilding Corp at Orange, Tex., has been made assistant deputy chief of staff to Maj. Gen. Frederick Gilbreath, commanding general of the South Pacific Base Command. Capt. Pascoe was educated at the University of Illinois. In 1939 he became a second lieutenant in the Engineer Corps.

Richard King has resigned as superintendent of construction and maintenance at the Defense Industries Limited, Pickering, Ont., plant, and has opened an office in Vancouver, B. C., where he will enter the general contracting business.

George W. Naill, formerly with The J. G. White Engineering Corp., New York, on war plant construction, is now in charge of forces constructing a hydro-electric plant on the Tiete River for the Companhia Paulista de Forca e Luz, north east state of Sao Paulo, Brazil.

Leo Paul Cabana has been appointed sanitary engineer of Montreal, Que. **Aime Cousineau,** a civil employee for 30 years, has been named director of the city's planning department.

William C. Daniels, Jr., office manager for the J. A. Jones Construction Co., Charlotte, N. C., prior to entering the Army in October 1942, was recently graduated from the officer-candidate school of the Transportation Corps at the Army air base at New Orleans, La. and commissioned second lieutenant.

C. Russell Cravens, regional manager at Omaha, Neb., for the Home Owners Loan Corp., has gone to Washington to become assistant commissioner of the Federal Public Housing Authority. He has been succeeded at Omaha by **W. C. Wilson,** who was West Coast representative for the HOLC.

Joseph T. Waugh, post engineer at the Army airfield at Alliance, Neb., has been promoted to major.

Richard F. Posten, former city engineer at Iowa Falls, Ia., has been loaned to the Government to serve as sanitary engineer in New Mexico.

Improved sewer system proposed for Columbus

A comprehensive program for an adequate sewerage system for the Columbus, Ohio, metropolitan area has been submitted to the Franklin County Planning Commission.

The program, based on a survey made by Jennings-Lawrence Co., engineers, urges appointment of a sanitary engineer and a reorganization of the county sanitary engineer's office. It also includes specific recommendation for trunk sewers and pumping stations. The proposal calls for financing of the trunk sewers by the county as a whole, with the cost of the sub-trunk and lateral sewers, where needed, to be met by local assessments.

The report said that county commissioners have legal authority to create new sewer districts and to make contracts with adjacent municipalities for joint construction and use of trunk sewers and for treatment and disposal of sewage.

Postwar works program planned for Pittsburgh

Pittsburgh has announced a postwar public works program of $36,000,000. This amount is exclusive of a $52,000,000 program for Allegheny County (*ENR*, Aug. 24, vol. p. 203).

Amounts allocated for various projects are as follows: Street paving $9,142,500; water mains $4,719,550; sewers $3,494,000; replacement of 160 flights of wooden steps with concrete $882,550.

The program is divided into these classifications: 38 projects in the "idea" stage, costing $6,102,000; 453 in the "preliminary stage, costing $25,092,690; 22 projects in the "design" stage, costing $1,276,100; and 11 projects for which plans have been completed, costing $527,260.

Frank M. Roessing is city works director; John D. Stevenson, assistant chief engineer, works department; and Williard H. Buente, chief engineer, city plan commission.

JOBS OF THE WEEK

DEWAXING PLANT, Rouseville, Pa.

Arthur G. McKee & Co., Cleveland, Ohio, has been awarded a contract for 1 and 2-story, brick, dewaxing plant, towers and tanks, for Pennzoil Co., Oil City, Pa. The estimated cost is $1,400,000.

HOUSING, San Diego, Calif.

Public Housing Authority, San Francisco, Calif., received the lowest bid on family dwelling units Calif. for Navy personnel from W. C. Crowell Co., Pasadena, at $1,099,000. Badmer, Wurdeman & Becket, Hollywood, are the architects.

DWELLINGS, Oceanside, Calif.

Shumaker & Evans Construction Co., Los Angeles, Calif., was the lowest bidder for constructing 450 family dwellings, when the Public Housing Authority, San Francisco, opened bids at $1,374,382. Risley, Gould & Reichart, Los Angeles, are the architects. Housing is for Naval personnel.

BARRACKS, Klamath Falls, Ore.

Brennan & Cahoon, Klamath Falls, were the lowest bidder for 12 barracks, 6 warehouses, swimming pools, etc. at Marine Barracks, when Bureau of Yards & Docks, Navy Department, Washington, D. C., opened bids, at $1,026,833.

GASOLINE PLANT, Winnie, Tex.

Stone & Webster Engineering Co., Houston, will design and construct a gasoline manufacturing plant for Glenn H. McCarthy, Houston. The estimated cost is $4,000,000.

ADMINISTRATION and OPERATIONAL BUILDINGS, Stockton, Calif.

Bureau of Yards & Docks, Navy Department, Washington, D. C., awarded a contract for the construction of administration and operational buildings at Naval Storage Depot, Rough and Ready Island, to Twaits, Morrison & Knudsen and Ben C. Gerwick, Inc., San Francisco, Calif. at $1,377,000.

APARTMENTS, Akron, O.

Westwood Manor, Inc., Westwood Manor Gardens, Inc. and Westwood Manor Village, Inc., New York, N. Y., awarded a contract for twenty-two 2-story apartments, to Psaty & Fuhrman, Inc., New York, N. Y. The estimated cost is $1,500,000. McMurray & Schmidlin, Union, N. J., are the architects.

Note—Additional bidding and contract news on many projects large and small appear in the Construction News section beginning on page 145.

WASHINGTON HIGHLIGHTS

The Senate will not consider the proposed water treaty with Mexico until after the new Congress assembles. The treaty, signed by representatives of the two governments last February, relates to the allocation of the waters of the three rivers with watersheds on both sides of the border, the Rio Grande, Colorado and Tijuana. Certain of the treaty's provisions with respect to waters of the Colorado River are opposed by California and Nevada, hence an active discussion of the treaty is anticipated.

Last week a Senate commerce subcommittee reached tentative accord on when an international compact is a treaty and when it is an executive agreement, but it left undecided into which category the St. Lawrence Seaway project should be placed. A treaty, the committee decided, is a solemn obligation ratified by two-thirds of the Senate and cannot be revoked by Congress, while an executive agreement was designated as a solemn obligation approved by a majority of both houses of Congress and which may be revoked by that body.

However, the St. Lawrence question may be soon decided, because the congressional fight to include the project in the $970,965,000 flood control bill continues as Senate debate on the proposed legislation grows in intensity. Recent developments in the Senate debate in regard to the bill include—the $29,230,000 Rowelsburg Reservoir project proposed for the Cheat River in West Virginia has been eliminated as unjustified; a proposed amendment to keep the Department of Interior for three years from building transmission lines for sale of public power from flood-control projects included in the bill has been defeated.

Present prediction in Washington in regard to the flood control bill is that backers of the St. Lawrence project and the proposed Missouri Valley Authority will carry their fight to a bitter end and that because of this fight recess of Congress may be delayed.

Residual fuel oil may be used again for roadbuilding and maintenance operations in all parts of the country except the West Coast States, Deputy Petroleum Administrator Ralph K. Davies announced Nov. 1.

Action permitting use of residual oil was taken by amending Directive 72 which prohibited the use of road oil as a paving material.

OBITUARY

Beverly L. Sneed, 70, of Roanoke, Va., vice president of the Virginia Bridge Co., died Nov. 27. He had been connected with the company for 43 years. Recently he had been working with the War Department in connection with bridges used by invasion forces and in barracks construction.

Glen E. Balch, 75, for many years the engineer in charge of New York Harbor surveys and channel improvements for the War Department, died Nov. 23. He was a civil engineer graduate of the University of Michigan, class of 1892. The War Department sent him to New York in 1896 to take charge of the opening and deepening of the Bay Ridge, Red Hook and Buttermilk Channels. Subsequently he planned the extension of Governor's Island to its present size. In 1910 he advocated the recently completed graving dock which extends out toward Robbins Reef from the Bayonne Peninsula. Surveying and developing Jamaica Bay between the years 1922 and 1925 was another of his projects.

Lt. Col. Russell C. Larsen, 47, former construction engineer for Los Angeles, Calif., was killed November 8 in an airplane crash in Texas. Lt. Col. Larsen was commanding officer, 9th Servicing Command, Ferrying Division, Army Transport Command, at El Paso, Tex.

Beresford Henry Segre, for the last 24 years engineer with the Department of Mines and Resources, died recently at Ottawa, Ont.

Thomas Jefferson Sanderson, 66, veteran contractor of Houston, Tex., died there on Nov. 7.

John Hansford Padgett, 43, with the War Research Laboratory of the College of Engineering, University of Florida, died in Gainesville, Nov. 16.

Clinton L. Harris, 58, professor of architectural engineering at Pennsylvania State College, died recently. Professor Harris had been associated with the college for 31 years.

Claude L. Ashley, 80, retired engineer, who helped to rebuild the Atlanta, Ga., water works system, died Nov. 14.

Arthur Charles Trory, 60, widely known in construction work in many parts of Canada, died at Toronto Nov. 16.

Francis Albertson Cokefair, 74, prominent in hydro-electric engineering until his retirement 23 years ago, died Nov. 13 at Seattle, Wash.

Jerome Shepley, 73, former Massillon, Ohio, safety director, died Nov. 11. At time of his death he was employed in the Stark County engineering department.

William J. Monaghan, 86, Toledo, Ohio, construction engineer, died Nov. 17. He was a member of the DeVore Engineering Co.

Charles S. J. MacNeill, 44, Dayton, O., engineer, died Nov. 20.

Herbert Brookfield, 96, of Chester, N. S., co-founder of the Brookfield Construction Co., Halifax, N. S., died Nov. 15.

Col. David L. Neuman, 54, of Columbus, Ohio, a civil engineer who has been in the Army since 1916, died Nov. 24 while on a military assignment in Marion, Ohio. After receiving his engineering degree from Columbia University he was engaged on various projects, including the erection of the Woolworth Building and the City College Stadium. In the first World War he was an officer in France for several months. In the present war he had helped build the Alaska Highway.

WEEKLY CONSTRUCTION SUMMARY

CONTRACTS

Continental U. S. Only (Thousands of Dollars)

	Week Ending Dec. 2 1943	Nov 23 1944	Nov 30 1944
Federal	$40,580	$15,800	$21,245
State & Municipal	3,814	1,112	3,694
Total public	$44,394	$16,912	$24,939
Total private	7,787	6,277	11,014
TOTAL	$52,181	$23,189	$35,953
Cumulative 1944 (48 weeks)			$1,636,496
1943 (48 weeks)			$2,937,565

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1943 48 Weeks	1944 48 Weeks
NON-FEDERAL	$312,514	$421,069
Corp. Securities	22,228	106,720
State & Mun.	124,608	169,409
RFC Loans	14,545	61,940
FPHA Loans	3,133	.....
REA Loans	20,000	20,000
Fed-Aid Hwy.	128,000	63,000
FEDERAL	$2,753,838	$1,263,800
TOTAL CAPITAL	$3,066,352	$1,684,869

ENR INDEX NUMBERS

Index base=100		1913	1926
Construction Cost	Nov. '44	301.09	144.73
Building Cost	Nov. '44	236.10	127.63
Volume	Oct. '44	91	40

MEETINGS

National

AMERICAN SOCIETY FOR TESTING MATERIALS and American Institute of Mining and Metallurgical Engineers, Symposium on Stress-Corrosion Cracking, Benjamin Franklin Hotel, Philadelphia, Pa., Nov. 29-Dec. 1.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, 10th annual convention, Hotel Commodore, New York, N. Y., Dec. 1-2.

AMERICAN SOCIETY OF CIVIL ENGINEERS, annual meeting, Hotel Commodore, New York City, Jan. 17-19, 1945.

Regional and Local

MIDDLE ATLANTIC SECTION, SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION, fall meeting, 330 West 42nd St., and Hotel Astor, New York, N. Y., Dec. 2.

NEW YORK STATE HIGHWAY CHAPTER, ASSOCIATED GENERAL CONTRACTORS OF AMERICA, 19th annual meeting, DeWitt Clinton Hotel, Albany, N. Y., Dec. 6-7.

CAROLINA ROAD BUILDERS ASSOCIATION, annual meeting, Charlotte Hotel, Charlotte, N. C., Dec. 8, 1944.

ASSOCIATED GENERAL CONTRACTORS OF MINNESOTA, 26th annual meeting, St. Paul Hotel, St. Paul, Minn., Jan. 11-13, 1945.

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Large company formed to promote N. J. housing

Formation of the $1,000,000 Precision-Built Homes Corp., one of the largest organizations in the country devoted exclusively to promoting housing construction, was announced last week by F. Vaux Wilson, Jr., of Trenton, N. J., president of the new concern and also vice president of Homasote Co., of Trenton. Homasote is one of the principal stockholders of the new concern but will maintain its present operating status and Mr. Wilson will continue as vice president.

Financed largely by contractors, dealers in building supplies and others in the housing industry, the new company will merchandise houses directly, license constructor-builders and engage in research, servicing and mass purchasing. Mr. Wilson said that the licensed constructor-builders will set up fabricating plants in major centers to service customers.

The Week in Engineering and Construction

Continued on page 102

Comment and Discussion

Readers' opinions on matters that concern engineers and contractors

Timber Unit Stresses

Sir: The article, "Postwar Effect of Emergency Building Specifications," by C. A. Willson, Engineering News-Record, October 19, 1944, vol. p. 497, was an interesting discussion of working stress developments.

Justification for the assurance of timber engineers that the increase of 20 percent in stresses for timber in W.P.B. Directive 29 is without reduction in safe strength, and that continued use of these stresses in postwar work may be expected rests in present day knowledge of timber properties and availability of assured stress grades of lumber. These latter are the results of progress during the twenty years to which Mr. Willson refers.

After careful study it was determined that assured accuracy of design and grading would span the 20 percent between a factor of approximate safety without this assurance and an actual factor of safety with it.

C. J. HOGUE
In Charge Technical Service
West Coast Lumbermen's Association
Seattle, (1) Wash.

What's Wrong With Engineers?

Sir: Mr. Boase's article in the Oct. 19 issue, "South American Building is Challenging," is not only comprehensively and competently written, interesting and revealing in its scope and illustrations, but it shows great vision and I consider it the most outstanding analytic and inspiring reporting which I have encountered for a long time in any technical publication. It is a frank statement of facts carrying implications worthwhile for the majority of practicing engineers to ponder. It is particularly a challenge to the younger men to stand on their rights to individual accomplishment and to use their skill and knowledge not only in proposing ideas, but they should see to it that their virile, progressive ideas find expression in actual structures.

The first question occurring to me after reading the article was: "What is wrong with us older engineers?" It certainly appears that we have been slack in supporting the progress of modern design principles and procedures, particularly as far as concrete structures are concerned. This seems to be apparent when one looks at illustrations not only in Mr. Boase's article but those featuring concrete structures built during the last decade in practically all important countries of the world.

The next question in my mind was whether we were lacking precedents in this country in the support of modern trends, and my answer to that is "No!" There are a number of institutions (Portland Cement Association, American Society of Civil Engineers, American Concrete Institute, American Railway Engineering Association, and others) and individuals publishing information, codes and technical papers taking into account known and proved advancement in the art. There are also groups of engineers and organizations attempting to put into reality such advancement. I will mention only one outstanding group, Admiral Moreell's "Can Do" Seabees.

What the real trouble with most of us running an engineering office is that we simply get tired of spending effort, time and money to fight for and carry through our own ideas of advanced design principles. Too often we hit a stone wall in transacting our business in the way we know we should, and instead of negotiating it, we compromise.

For instance, as long as we have to deal with chief engineers of building departments in some of the principal cities who insist that the theory of flexure is only applicable to the extent of formulas incorporated in the building code, and who outlaw the theories of rigid frame and membrane analysis in spite of the rigid frame bridges and structures functioning according to the membrane theory staring them in the face from beyond the borders of their authority; as long as we have large industries like railroads who insist on applying specifications for concrete structures 30 years old contrary to the recommendations of the American Railway Engineering Association; and as long as we have, even in the cement industry, companies without competent concrete designers in their engineering staffs, I think we old ones alone can do only a very limited job. We need the enthusiasm, courage and skill of a new crop of young engineers to bring about changes in the art of structural design and particularly of concrete construction which would spell real advancement.

What can be done to improve the situation?

First of all, it is essential that professional services should be entirely separated from politics as, for instance, is done in the administration of law in England, and as we have made a good start here in appointing city managers.

Secondly, in colleges and universities there should be provided special courses for engineering students specializing in structures. Such courses should absolutely require thorough training in the theory of elasticity, dynamics, analytic and descriptive geometry and mathematics beyond that generally included in our technical school curricula. Compensation of college professors should equal the income of the best consulting engineers, thereby raising their social standing and the esteem of the community for them.

Third, more uniform and less restrictive building codes throughout the country would be greatly beneficial. It is not a question of raising unit stresses or in any way relaxing provisions which would jeopardize health, life or property. It is a question of making provisions in codes which will safeguard the public while permitting greater freedom of design. Codes should not be written so as to make the practicing engineers design structures to the limit they think will be approved but on the contrary codes should enable engineers to use their ingenuity to the limit of established knowledge, knowing they will find in the plan examiner and building commissioner men competent to determine whether their designs come within the broad spirit of the code.

Fourth, the best equipped, most progressive engineers should be attracted to become city engineers,

which in turn means proper compensation for their services. Doubling or tripling present salaries of engineers and architects in city and federal services would result in savings to the public many times what the increases in salaries would amount to. At the same time the bottleneck would be removed which, in my opinion, is most harmful to the progress of engineering art.

J. E. KALINKA
Vice-President
Roberts and Schaefer Co.
Chicago, Ill.

Grand Coulee Pump Lift

Sir: In reading the article "From An Editor's Notebook", (*ENR* Oct. 26, vol. p. 526), I noted in connection with the comments on Grand Coulee Dam that you state the irrigation water will be lifted seventy feet from the lake to the storage basin. I am quite certain that this lift will be 280 ft. I believe the error is significant in that it detracts considerably from the magnitude of the job to be done; therefore I call it to your attention.

EMIL C. JENSEN
District Engineer, Dept. of Health
Spokane, Wash.

[Mr. Jensen is correct. The twelve single-stage pumps will lift the water 280 to 360 ft.—Editor.]

Not Beyond the Law

SIR: Your editorial published in the issue of Nov. 2, vol. p. 545, and entitled "Beyond The Law", demands a discussion. In my opinion, the title of the editorial and its contents do not properly construe the registration laws which have been drawn in accordance with the various model laws. Your statement, "The sole purpose of a license is an attempt to determine an individual's *technical* competence as a means for public safety," is inconsistent with the facts.

The various model laws and most of the state laws contain the following or similar provisions.

(a) The general purpose of the law is "to safeguard life, health, and property."

(b) "No person shall be eligible for registration as a professional engineer or land surveyor who is not of *good character* and *reputation*."

(c) The board is empowered to revoke the certificate of any registrant who is found guilty of "gross negligence, incompetency, or *misconduct in the practice of professional engineering* or land surveying" as a registered professional engineer or land surveyor.

The Nebraska State Board of Examiners for Professional Engineers and Architects was one of the first state boards to adopt the practice of using a code of ethics as a part of the application blank. It has also published and distributed a "Recommended Code of Practice for Professional Engineers and Architects."

If "technical competence" means only technical knowledge or ability, is it "within the law" for the registrant to use his knowledge to cheat his client, to create a fire hazard so a client may increase his profit, or to promote an uneconomical project so stock can be sold to the unsuspecting public, but always being sure these actions do not run counter to criminal law. If "technical competence" is not expanded to "professional competence" there is no way by which the public is protected. There is no professional "character" and there can be no "good reputation" in a professional sense. Further, if there is no published statement of a code of ethical practice, by what standard can a board pass upon "misconduct in the practice of professional engineering"?

Your contention that conformance to high ideals is not obtained by compulsion is frankly acknowledged. You should in turn acknowledge, however, that high ethical ideals are enhanced and improved by repeated consideration of their value and necessity. It would appear that all examining boards who repeatedly assert a high idealism on the part of the registrant are serving the best interests of the citizens of their state and the country at large and, in my opinion, are not acting "Beyond The Law."

ROY M. GREEN
Secretary
Nebraska State Board of Examiners for Professional Engineers and Architects

South American Building

Sir: I have just received my copy of the Oct. 19 issue of *Engineering News-Record*, and wish to thank you for the splendid article by A. J. Boase describing construction in South America as he found it. I am greatly interested in this article, and am looking forward with eager anticipation to the additional ones he prepares.

I feel that this is one of the best programs that *Engineering News-Record* has sponsored, and you should be congratulated not only for the desire to bring first-hand information of South American design and construction of buildings to the engineers of this country, but also for your wise selection of Mr. Boase to carry it out.

LEONARD E. DUNLAP
Nimmons, Carr & Wright—Architects
Chicago, Ill.

Argentine License Laws

[The following extract from a recent letter written by an Argentine engineer will be of interest to many North Americans. For obvious reasons, the writer's name is withheld. See also the editorial comment on p. 60—Editors.]

"I work as an independent engineer in Argentina, doing quite a bit of work for American firms. The words 'independent engineer' remind me of a fact which might be of some interest to you, namely that the Argentine government has recently published a decree whereby engineers who did not graduate at a national university or revalidate a foreign diploma are no more allowed to call themselves engineers, and what is more, are not allowed to do engineering work. Offenders are threatened with imprisonment of from 2 to 12 months!

"Though it is not yet quite clear how this decree will be effective in practice, it is nevertheless true that almost all foreign engineers will be outlaws from now on and will have to reckon with the possibility of a rigid application of the law at any moment. I leave it to you to draw your own conclusions from these facts.

"I am not even quite sure whether it will be safe in the future to be a subscriber to an engineering magazine, for one of the articles of the decree says that persons who don't have the necessary qualifications to call themselves and work as engineers may not by any means, neither by writing nor by sound, make known to others that they pretend to be engineers. And receiving an engineering paper might be an indirect manifestation of such a pretense. This last statement might seem exaggerated, but it takes into account the wording of the decree."

EDITORIALS

VOLUME 133 NUMBER 22

November 30, 1944

Contractor Public Relations

ACTIVITIES of the Associated General Contractors of America in public relations are most encouraging, for contractors long have been handicapped by indifferent and adverse contacts with the public. Latest in the association's efforts to improve the public's opinion of contractors is compilation of a public relations manual that merits study by executives of every construction organization. Concerning the general public the booklet emphasizes starting at the inside and working out—doing good housekeeping on the job, reducing the inconvenience of people near the job, educating every employee to represent the contractor courteously in all public contacts. When improved working conditions are instituted or when public or employee safeguards are instituted, the public might well be informed of such constructive contractor activity. Too frequently construction men ignore, even antagonize, the local press representatives. Then, if an accident or a controversy arises, the press and frequently the public are already alienated rather than understanding and cooperative. Postwar construction planning may well include better public relations. The AGC manual offers many useful suggestions.

That Job in South America

ENGINEERS AND CONTRACTORS who may be entertaining rosy dreams about postwar activities in South America should not overlook some important facts, which may dim the prospects of participation. Not the least of these is the necessity for possessing an engineer's license and registration in the country where one proposes to practice or engage in construction work. The requirements for such registration are quite rigid, including, in most countries, the possession of a degree from a national university. How rigid the situation has become in Argentina is indicated in a letter published on page 59 of this issue. In other countries, similar decrees relating to engineers and engineering work are in existence, although this may not have been obvious during the wartime emergency, since in most cases the consultants and contractors engaged on war-related projects operated under special dispensations. Whether or not restricting engineering practice to one's own nationals, who are graduates of designated universities, is to the best interests of a country is not for us to say; it is a matter of record that freedom rather than restriction worked well in the United States. But the important thing for foreign-minded U. S. engineers to realize is that in South America, as in Rome, one must do as the Romans do—or as they require you to do.

Financing Postwar Roads

ONE OF THE PROBLEMS now being faced by highway engineers is that of financing the large amount of road work that should be done in the immediate postwar years. That financing is complicated by the curtailment of automobile travel in the war years and the fact that inability to replace wornout cars will automatically check the sharp rise in gasoline consumption and in gas-tax receipts that otherwise would follow the war. That the effect of these checks on income is not going to be as serious as some pessimists predict, however, is shown by a survey just made by the American Association of State Highway Officials, as reported in last week's issue. Nevertheless it appears obvious that the anticipated lower income is responsible, in part at least, for the decision of some highway departments to spread the work covered by the postwar highway bill now in Congress over four or five years, instead of concentrating it in three years, as contemplated by those who wrote that legislation. Commitments for the federal aid must be made within the three years following the war, but expenditures under these commitments can be spread over five years. Many highway authorities are concerned over that prospect because they hold that a higher rate of highway construction is essential to a sound postwar economy.

An Opportunity

CIVIL ENGINEERS are to be afforded an unusual opportunity to improve their contacts with business and civic leaders through the cooperative arrangement just made between the American Society of Civil Engineers and the Committee for Economic Development in connection with postwar operations. Throughout the country, the committees on postwar construction, which have been set up by the A.S.C.E. local sections, are to serve as advisers to C.E.D. community committees on all matters relating to postwar construction. Malcolm Pirnie, president of the A.S.C.E., is to head a national C.E.D.

committee to integrate the activities of the two organizations on a national level. For the immediate problem of getting postwar thinking into concrete form, the local committees of engineers should be able to advise local business men on community needs that could well be met in the postwar period; the business men, in turn, should be able to help the engineers uncover and foster the private construction work in their communities that now appears to be lagging behind public construction. For the more distanct future, this closer cooperation between engineers and business men should do much to stimulate wider appreciation of engineers as an important element in the social and economic life of the community.

Construction Equipment Prospects

THERE IS GOING TO BE ample construction equipment to meet war requirements and postwar needs as well. Such positive statement is amply supported both by analysis of all available facts and by numerous authoritative announcements that indicate recent improvement in the situation. Moreover, no signs have yet appeared to cast doubt on the frequent assertions from high places that there will be no surplus equipment problem in the construction field comparable to that in many other war-expanded industries. On the other hand, a few surpluses of individual items are bound to develop, and these can prove malignant unless properly quarantined and treated. Such, in brief, are construction equipment prospects as the end of 1944 approaches.

The prime reason for the improvement recently noted can be found in the changing war picture. Narrowing of the European war to single-line fronts in Northwestern Europe and Northern Italy not only permits more economical concentration of supply of construction machines, but it also allows release of vast quantities of machines and spare parts from depots in North Africa to augment those available from the now-secure bases in the North Atlantic and the Caribbean. To such supplies coming to hand for reuse is added a production of new machinery and spare parts that will total $800 million in 1944, or more than six times what was considered normal in peacetime.

Thus, military authorities, although continuing to emphasize a close squeeze on tractors, bulldozers, cranes and shovels, are pretty well satisfied that neither the European nor the Pacific wars can now be slowed by construction equipment shortages. And obviously, if we can manufacture six times the volume of a peacetime year, there need be little fear that postwar civil work requirements cannot be met.

Sufficiency of supply, therefore, is assured. What about oversupply? Are we apt to have construction equipment "running out of our ears" for years, bankrupting manufacturers and throttling their ability and enthusiasm for developing new and improved machines, without which the American construction industry would die on the vine? Here again military authorities are sanguine, pointing out that very little equipment will be returned from overseas; that those machines in their hands here will be needed for military maintenance; and finally that our war achievements with American machines in foreign lands have fostered an export market that will take the products of any excess capacity our construction equipment manufacturers may have.

Prospects for construction equipment both war and postwar are, therefore, better than could logically be expected after such tremendous changes as the last few years have caused. Yet there is one problem, and a serious one, that remains to be solved and that is the more difficult, because it is as yet not generally appreciated. It involves the sensible disposal of certain items of equipment, even particular makes of equipment, in which large surpluses may develop. Some means must be found to feed those machines into the market without causing disastrous price deflation or requiring the particular manufacturer to suspend new production activities until the surplus machines are absorbed.

It is fair to assume that the Army Engineers and the Navy Bureau of Yards and Docks, who have both the responsibility for military construction equipment and a sympathetic attitude toward the problems that its acquisition and sale occasion, will solve this problem of individual surpluses in sound manner. Yet it is not too soon for them and for the construction industry to be studying the available means and methods. With this problem out of the way there is little reason to doubt that there will be clear sailing ahead in so far as construction equipment is concerned.

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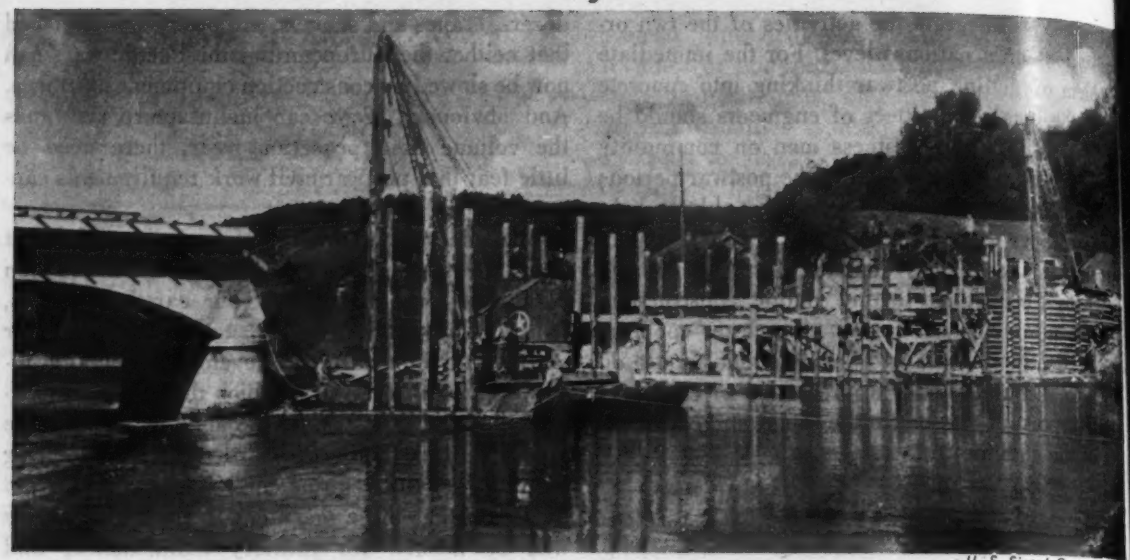

U. S. Signal Corps photos

Fig. 1. Engineers of the 7th Army replacing wrecked spans of the Moselle River bridge at Jarmenil, France.

Engineer Operations in France

Maj. Gen. Cecil R. Moore
Chief Engineer, Headquarters, European Theater of Operations

***Editor's Note**—At a recent press conference at Supreme Headquarters, Allied Expeditionary Forces, General Moore undertook to provide the correspondents with background material on Engineer operations in France from D-day until early in October. So clearly did he describe not only the Engineer organizations but some of their hitherto unrevealed accomplishments that his informal remarks are here presented as one of the most readable and informative articles to come out of the European Theatre.*

AT THE PRESENT TIME we have in this theater about fifty different kinds of Engineer troop units serving in every component of the Army Air Forces, the Field Forces, and the Service Forces in the Communications Zone. Virtually all of our work is done to serve some other arm of service in the fulfillment of its mission.

Engineers with the Air Forces build, maintain and defend airfields, furnish fire protection and reproduce maps and charts for all installations. In the Ninth Air Force, the Engineer Command is one of the largest components and operates as a unit in the same way as Bomber Command, Fighter Command, and Air Service Command.

In the Field Forces, each infantry and armored division has a combat engineer battalion that is used either as a single unit or is split up so as to attach one company to each regimental combat team. During the assault on the beaches an extra engineer combat battalion was assigned to each assault division area. Divisional combat engineers do bridging, mine removal and essential road maintenance, water supply plus forward demolitions and special assault work on enemy fortifications as needed.

Behind the Divisions in each Corps there is one or more engineer groups consisting of a headquarters controlling four engineer combat battalions, one or more engineer dump truck companies, a topographic company and any other special units that may be attached from time to time in accordance with the mission of the Corps.

In the Army area are found more combat battalions, plus engineer general service regiments with heavier equipment and more trained specialists equipped to do a variety of large and complex engineer work. Each Army has an engineer topographic battalion to print special maps in the field, a water supply battalion, a camouflage battalion in addition to maintenance companies and depot companies to operate the engineer depots.

Engineers in the Communications Zone will include large numbers of general service regiments, port construction and repair groups, port repair ship crews, dredge ship crews, a base topographical battalion, more shop and depot companies, pipeline companies, gas generating companies, a model making detachment, fire-fighting platoons and many other special troops.

We are responsible for all construction in the theater of operations except signal construction. This in-

ades airfields, camps, railroads, oads, bridges, pipelines, ports, in- nd waterways and utilities. All of hose projects except railways are aintained by engineer troops. Maps, each and terrain intelligence, the udy of natural resources, camou- ge, water supply, bulk supply of etroleum products, materials of con- truction, real estate, and firefighting re other jobs that we must contend ith.

Engineers in this war and the last

The percentage of engineers to the otal force in this war is just about he same as it was during the last, ut the amount of work to be done as increased almost astronomically. There was no port work of rehabili- ation to be done, no operation of pen beaches, no mines to be lifted, ery few booby traps, and hardly ny airfields to be built. The burden of providing adequate road, rail and port facilities is emphasized by the present day requirement in excess of *a thousand tons per day* to supply each front line division and its sup- porting troops. The difference in re- quirements for petrol, oil and lubri- cants is scarcely comparable since all the gasoline consumed by General Pershing's AEF during the entire campaign would scarcely be consid- ered more than a fair operational re- serve for our armies in the field and our air forces. And, of course, we have made substantial progress in our Engineer capabilities by the use of mechanical equipment.

A characteristic of our operations in this war is the almost complete absence of sharp demarkations be- tween the work of the Division, Corps, and Army troops and those of the Communications Zone. I am a great believer in early reconnaissance since a day saved in reconnaissance is al- ways a day saved in getting the final job done. We are making extensive use of airplanes for this type of work. I have personally made low-level reconnaissance of almost all the rail- road mileage we are now developing. By flying in a moderately slow plane at an altitude from 50 to 100 ft. it is possible to see the exact condition of a right-of-way—the amount of damage and the bridges that need re- repair and rebuilding. Then we can lay out the job accurately and send the proper number of men and the right amount of equipment so that the job can be completed on schedule.

This early reconnaissance can be carried to extremes as was done early in October by Col. John Person, head of our Military Pipe Line Service. After completing a flight in one of the forward areas, he made a wrong turn on the way back and discovered that he had been flying over German- held territory for more than an hour.

The military pipeline is another new development in our communica- tions enabling us to deliver bulk gaso- line to forward areas without clutter- ing the roads with tank trucks. We estimate that each pipeline we put in has the effect of removing 400 trucks a day from the roads. The pipeline itself is quite economical of tonnage, even when it is being built, since we need only 30 tons per mile for our 6-in. pipeline. and 16 tons per mile for our 4-in. pipeline. As many as 50 miles of line have been laid in a single day.

The volume of actual engineer work to be done in the present opera- tion is such that there are not enough engineer troops to do all the jobs that might be given to them. For example, all of the assault Divisions that spear- headed the U. S. invasion were given what almost amounted to basic en- gineer training in explosives, demoli- tions, the use of flame throwers, bangalore torpedoes, and wire-cut- ters at the Assault Training Center in England under the direction of Col. Paul Thompson, an engineer offi- cer specially qualified by his knowl- edge of enemy fortifications and assault doctrine. The land mine war- fare, both anti-tank and anti-per- sonnel has reached such a stage of development that it is entirely beyond the capabilities of our limited num- ber of engineer troops to detect and remove all the mines that are encoun- tered. As a result it has been neces- sary to give the infantrymen and the

Fig. 2. A "Seatrain" gantry crane, set up by Army Engineers at Cherbourg, swings an American-made gondola car onto railroad tracks at that port.

Fig. 3. A salvaged German diesel-driven shovel, rechristened the B-29, assists a smaller G.I. shovel clear away wreckage of the "Gare Maritime" at Cherbourg.

Fig. 4. Combat engineers use one of their compressor and air-drill outfits to cut bad spots out of a pavement near Barneville, France. Patches are made with concrete prepared in a captured German mixer, shown in the distance.

men of other services training in the use of mine detectors and methods of removing and neutralizing enemy mines and booby traps.

Restoring the railroads

The excellent work done by the RAF and the AAF in destroying the railroad yards, bridges, and rolling stock created most of our railroad work for us. Indeed, so thorough a job of destroying rail communications was done in France that the Germans finally gave up trying to repair them. There is no doubt that this work of the air forces in isolating the Germans in Normandy from their supplies and reinforcements had a decisive effect on their ability to repel the invasion since they could not mass troops to bolster their shattered defenses.

We have the mechanical means of doing many tasks that the enemy could not do either as effectively or as fast. A number of our engineer general service regiments were specially trained in railway construction and railway bridging. The work of these regiments is almost unbelievable and it must be a great surprise to the Germans to see American locomotives and cars practically at the front lines despite all the damage done by our air forces and by the German demolitions.

Effect of Normandy break-through

Perhaps the most dramatic achievement of the Engineers in railroad reconstruction came during the period Aug. 13-15. The break-through had occurred, and our troops were pouring through the Avranches-Coutances funnel into the interior of France and toward Paris. The rapidity of the thrust had disorganized the Germans and our most pressing problem was supply of our fast-moving spearhead troops. Railways were essential.

On the morning of Aug. 13, we had two general service regiments with attached dump truck companies working on railroads, when we were asked by General Patton to have the railroad leading into Lemans and Laval operating in 48-hr. This job entailed the rebuilding of seven railway bridges in various stages of demolition; the repair and laying of totally new main lines in three railway yards; the laying of many miles of new rail approaching the yards and the bridges within the target area; and the provision of facilities, such as watering points for locomotives where water towers had been demolished.

Miracle performed in 48 hrs.

It was a monumental job if spread over a period of months. In 48 hrs. it seemed almost impossible. Three additional regiments were rushed into the area, and all the heavy equipment that could possibly be spared from other equally pressing jobs was moved to the bridge and yard sites. By day and by night, the highways leading from Cherbourg and the beaches were jammed with trucks immediately dispatched for essential material and equipment. Even while the bulldozers were clearing the debris and troops were moving onto the job, Engineer officers, in hastily thrown up drafting tents, were designing new bridges for the job.

As the deadline approached, trains heavily laden with gasoline and supplies and ammunition moved up past Coutances into Avranches. And by midnight, August 15, they passed Ste. Hilaire du Harcourt, across the last bridge that remained to be completed and on to Lemans and Laval and Patton's fighting men.

There is one other small picture of this critical 48 hrs. that is worth recalling. The bridge at Ste. Hilaire du Harcourt was close to the highway along which Third Army troops were passing. And even as the general service regiment constructing the railway bridge was at work on the railroad right-of-way, combat engineers from the Third Army—less than twenty-five yards distant—were strengthening a Bailey truss highway bridge.

For me, there was something symbolic in that meeting of combat and

SOS engineers at Ste. Hilaire—in one sweeping glance, you could see men who, night and day and night after night and day after day, pressed hard upon the Nazi soldier's heels. And you could see, too, those men who, night and day for months on end made it possible for the fighting forces to constantly blow hard upon the retreating Nazis' necks by keeping supplies rolling to the front. Here, at a glance, you could see the supply lines meet the battle lines—and I think the meeting was good for all concerned.

Supply and the port situation

It must be apparent by now that the key to the success of the invasion has been our ability to move unprecedented tonnages of equipment and cargo over the open beaches. Despite their experience on the receiving end of our beach operations in Africa, Sicily and Italy, the Germans greatly underestimated our capabilities in Normandy, and since their whole defense plan was predicated upon the denial of ports to the Allied forces, the ability of our Engineer Special Brigades, working with the Transportation Corps and the Navy, to move great tonnages over our American beaches completely upset their calculations.

Now we have a number of ports in our hands—some in better condition than others. The only important consideration is, "How much deep-water berthing facilities does the port have?" In other words, how many Liberty ships can be anchored alongside the docks and unloaded directly on trucks or railroad cars for movement to the front? That is the only important advantage a port can offer over the operation of a beach. If there is nothing except shallow water berthing facilities, the Transportation Corps must use coasters, DUKW's, or Rhino ferries to move the cargo. And then the operation is subject to delay because of unfavorable weather or tidal conditions.

Thus, it can be seen that we still have a major problem of developing and rebuilding port facilities adequate to support the great forces massed here in this theater. It has meant that every facility had to be repaired and brought up to completion as fast as possible because, in the aggregate, the tonnages from all our little ports and our beaches had to add up to the needs of the Armies in the field.

A look at the map shows that another limiting factor in our utilization of the ports in our hands is the distance they are from the fighting fronts. Each advance by the armies means longer road and rail communications, which we must rebuild and maintain for the use of the Transportation Corps.

A limiting factor in the use of Cherbourg and our own beaches is the one rail line from Cherbourg to Paris which had to carry not only our supplies but those from the British beaches farther east in the vicinity of Bayeaux and Caen as well. Thus, we repaired this line but had also to use the lines through St. Lo, Coutances, and Vire in order to avoid congestion in the beach areas. These single track roads had heavy grades, posed difficult reconstruction jobs, and there was plenty of bridging to be done.

Road maintenance of the Red Ball Highway (from Normandy to the front lines) and other roads important to our supply lines requires the services of five regiments or a total of 6,000 men. Although that is a heavy commitment, it will become more of a job as we get into fall and winter weather. Road maintenance close to the front, or in areas where there was heavy fighting, creates more problems.

Planning engineer supply

Engineer supplies are probably tied more closely to the ground to be covered than are those of any other service. Aside from the standard organizational equipment of each engineer battalion and regiment, the type and quantities of bridging, railroad and port repair equipment

Fig. 5. A Bailey bridge was used by combat engineers of the 7th Army to cross the Moselle at Epinal.

and materials must vary with the terrain. If the country has wide rivers, one type of bridging is needed, if the streams are narrow with high banks another will be required.

Intensive studies made of the supply work in Italy and North Africa were of great help to us in our planning for this operation, for when every ton of shipping is important it is vital that we have the right kind of materials and equipment at the right places to do the job. In that respect our advance planning was in such detail that there has been no serious shortage of any items needed to accomplish our mission.

The railway bridging selected for this theater was ordered over two years ago. Because this was before the exact point of attack was known, our engineer planners had to assume Northwestern Europe as the operational area. From their studies they found that approximately 30 ft. of railway bridging would be needed for each mile of railroad. When the actual assault area was known, a recheck of the figures showed that a 30-ft. per mile figure was on the high side.

Maintenance problems

Railway practice varies so much from one country to another that even the tools required here are different from those we use in the U. S. Switches, cross-overs and erection equipment were procured for the exact conditions here in France.

Utilities, power and water supply were also studied thoroughly to determine what materials must be on hand to repair damaged and destroyed equipment.

Transformers, insulators, connectors, motors, generators and the thousands of smaller items must fit the voltage and the distribution systems we encounter.

Another sizable part of our engineer supply problem is the maintenance of our heavy equipment and the supply of spare parts. Although not as large a problem as that of the Ordnance Department, our Engineer equipment requires the storage and issue of more than 100,000 spare parts. These must be on hand when and where they are needed since we depend so heavily upon our equipment in the accomplishment of our mission.

We solve the maintenance problem in two ways—each regiment has a shop truck that can undertake most of the maintenance required by its equipment. This includes welding, machining of parts, grinding, cutting, sharpening, threading, and other light machine operations. When heavier maintenance is necessary, it must be sent to the heavy shop company which is equipped to repair and rebuild the largest and heaviest equipment that we use, such as the 22-ton D-8 bulldozer or the 34-E pavers.

Supplies left in France

The speed of the drive which liberated France made it difficult for the Germans to move much of their equipment and supplies back to Germany and our troops have made good use of what they have left here in dumps and depots.

With respect to our relations with our French allies, we have received most enthusiastic and practical cooperation, and are grateful for the important assistance rendered to us. French technicians have been especially helpful in our railroad work and in the restoration of utilities.

Cooperation with French

It is our policy to assist the French people in every way that we can within the means available. In other words, we have not just limited our work to what was the barest minimum for our needs, but have tried to help them solve their problems and assist them in restoring the civilian economy.

An example is the power supply in Paris, which is now three times as great as it was when we came. We are also assisting them in the rebuilding of the power line between Cherbourg and Avranches. Naturally, the French have been short of some tools and equipment — especially trucks and mobile field construction equipment. We have loaned them our earth augers for digging post holes as well as dump trucks and some heavy equipment.

We appreciate their problems and they understand the limitations imposed on us by military operations. At the present time many of our installations are being guarded by French troops thus releasing our specially trained technicians to do the type of work they can do best. This splendid spirit of cooperation on both sides has been a valuable contribution to our Allied war efforts.

Our Engineer Service also deals extensivcly with the French government and people in requisitioning real estate for the use of our troops. It is necessary that accurate records be kept of all the land and buildings used—a job in itself that amounts to literally thousands of transactions. In each of our Base Sections, we have twelve men working full time on the requisitioning of property. Already, we have requisitioned more than twenty-five thousand pieces of property for the United States Army.

Finally, since we are the largest user of civilian labor, we hire all civilians that are employed for any purpose by the United States Army here on the Continent.

Fig. 6. Engineers restoring track on a rail line wrecked by the retreating Germans.

Soil-Cement Paving Costs Reduced By Use of Clay Marl

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Contents in Brief—Use of clay marl for soil-cement paving operations on a airbase project reduced the cement requirements appreciably and permitted a large construction cost saving. Elimination of side forms when processing the individual lanes was made possible by minor modification of the accepted paving procedure. The practice of starting the processing operations in the early morning hours, plus careful control of the moisture content in the soil cement, including application of a light seal coat, were important factors in construction of a strong pavement at a rapid rate.

SAVING OF SEVEN PERCENT in the amount of cement required for soil-cement surfacing on a big airbase in Florida was made by adding clay marl over the sandy topsoil at the site. The original surface material was a fine sandy loam which would have required 16 percent of cement by volume to provide a base course of the desired hardness. The selected borrow, which had to be hauled about three-quarters of a mile, required slightly more than 9 percent of cement for a 6-in. compacted depth. Its use also made possible a large saving in construction cost. An analysis of the borrow material is given in Table I.

The airport was built for the Naval Air Operational Training Command. Some 360,000 sq.yd. of soil-cement base course, designed for a 15,000-lb. wheel load, were required to provide four 180-ft. wide runways 4,000 ft. long. Also required were about 8,000 lin.ft. of 50-ft. wide taxiways and 1,600 ft. of 20-ft. access road.

Construction of the runways, which was typical of all paving operations, was in 30-ft. lanes, the work being started on a lane near the runway center line and progressing toward the edges. Preliminary operation for each day's work consisted of trucking in sufficient clay marl to provide a 6-in. compacted base course, this material being spread with control graders to about ½ to 1 in. above finished grade to allow for compaction.

Alignment and grade were maintained by setting stakes at 30-ft. intervals 1 ft. outside of the lane to be processed. For the first lane being processed, stakes were set on each side. Thereafter, only one line of stakes was necessary, the edge of the completed soil-cement base serving as grade control for the other edge of the lane being processed.

No forms were used

General practice dictated the use of a 6x6-in. timber form on each side of the first lane processed and on the outside of each succeeding lane. However, on this project, it was found that longitudinal joints, final grade and surface could be maintained satisfactorily without forms. Their elimination was made possible by minor modification of the accepted construction procedure.

First, sufficient untreated borrow material was added for the full width to be processed, plus sufficient width at either side to insure definite establishment of grade control. Then, during processing, the soil along the outer edges of the lane being mixed was moved away from the untreated material with a motor grader, leaving a partly consolidated shoulder to be used as a form. After completion of the mixing operation, the soil-cement mixture was bladed to the edges and consolidated.

To insure neat, durable longitudinal joints, the outer edge of the completed section was cut back for a distance of 12 to 18 in. with 28-in. dia. disk mounted on the end of the mold board frame of a motor grader (Fig. 10). This operation was carried out after the soil along the edges of the new lane being processed had been removed, all the material cut away being incorporated in the mixture being processed. This procedure avoided improperly mixed material along the edges, insured a neat joint of full thickness, and provided the necessary form for grade control. The work was planned so that the completed base course was at least two or three days old before an adjacent lane was processed.

Cement added at early hour

The processing and compaction operations were as follows: The bags of cement required for the lanes to be processed on a given day were distributed by trucks in the early morning hours, the bags being spaced 5 ft. transversely in the 30-ft. section and 4½ ft. longitudinally. This spacing provided 0.1 bbl. of cement per square yard of base course or 8.89 percent by volume for a compacted depth of 6 in. The bags were cut open with a hand shovel, the cement dumped in piles and then spread uniformly with spike-tooth harrow with the teeth in a flat position. The work of spreading the cement was started sufficiently early in the morning to permit dry mixing of the cement and soil to begin at 6 a.m.

Mixing was accomplished with the disk harrows, cultivators and rotary tillers, aided by a five-bottom gang plow cutting to a depth of 6 in. The plow, which was mounted on a heavy road-machine frame, was found to be indispensable for proper depth control and uniform mixing. Upmost care was exercised to mix to the full 6-in. depth and no deeper, both

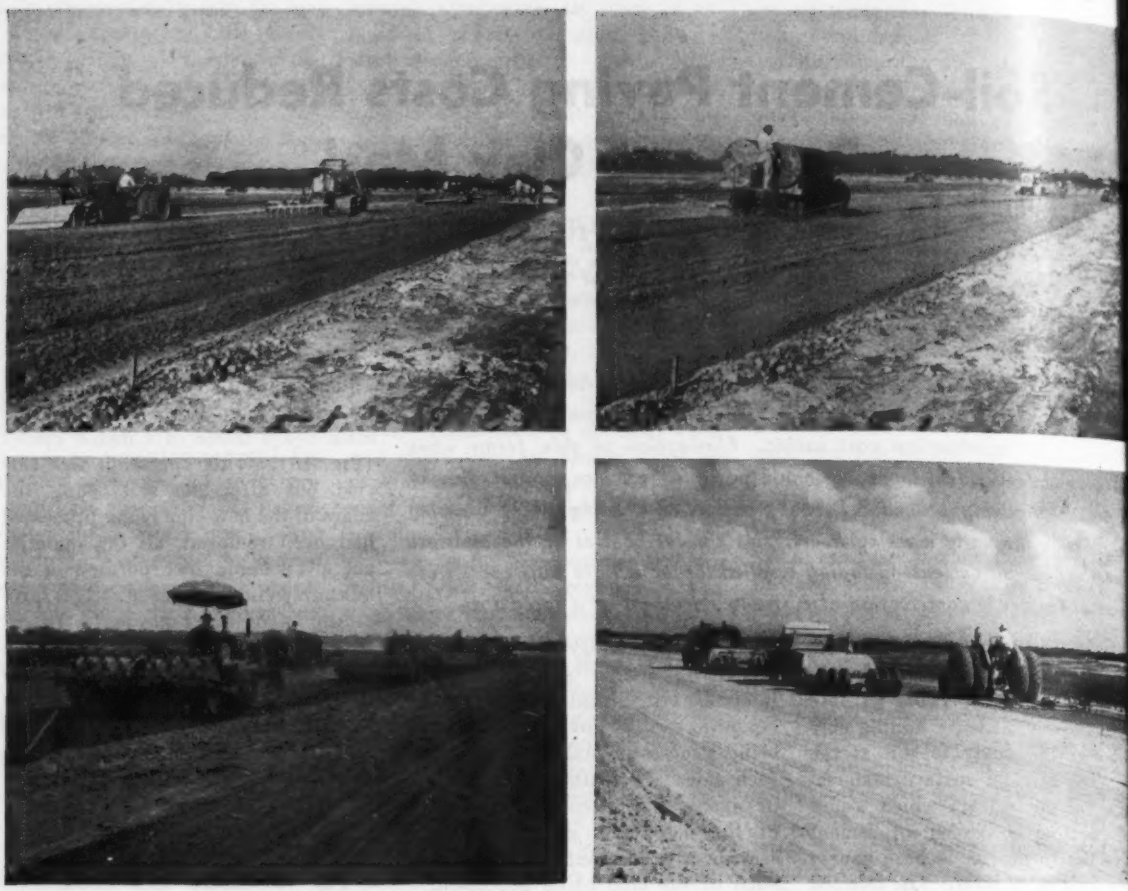

Fig. 1. Upper Left: Rotary tillers, disk-harrows, rigid-tooth cultivators and a five-bottom gang plow were used for the dry mixing operation. Upper Right: About 75 percent of total water considered necessary was applied before moist mixing was started. Lower Left: Four double-drum sheepsfoot rollers were required to obtain the primary compaction for the full depth of the slab. Lower Right: After a drag harrow had broken up the crust created by the sheepsfoot rollers, pneumatic-tired rollers continued compaction.

during the dry mixing and later during the moist mixing. The depth of mixing was checked by stretching a string line between grade stakes and measuring the depth of the furrow opened by the plow.

Allowance made for evaporation

Toward the end of the dry mixing operation, representative samples were taken and the quantity of water necessary to bring the section to optimum moisture was calculated. To allow for evaporation, the theoretical amount of water calculated as necessary for good compaction was increased by 20 percent. About three-fourths of the total amount was added from pressure distributor tanks before moist mixing was begun.

Moist mixing was accomplished in the same manner and with the same equipment as used for the dry mixing. Check moisture samples were taken toward the end of the moist mixing, and any additional water needed to produce the optimum was added as required. When the entire section had been thoroughly mixed for the full 6-in. depth and its moisture content had been brought to the specified optimum, the material was spread over the full width of the lane and all the mixing equipment was removed.

Next, the section was given a preliminary shaping with motor graders, the surface material being loosened to a minimum depth of four inches with disk harrows, and then compacted with sheepsfoot rollers. Utmost care was exercised to obtain thorough compaction on all edges. Normally, the edges were consolidated with sheepsfoot rollers supplemented with pneumatic-tired motor graders.

In order to eliminate compaction planes and to insure uniform compaction over the entire surface, a spike-tooth drag was used in conjunction with the sheepsfoot rollers during the latter part of rolling. When the base had been consolidated thoroughly to within about 1 in. of the surface, the rollers were removed and the spike-tooth drag again covered the section. The loose material was shaped uniformly, with motor graders, the section again dragged with the spike-tooth drag, weighted if necessary, and the top material compacted with pneumatic rollers.

After the compaction work with the latter equipment was complete, the surface was "hard bladed" with motor graders to remove any high or irregular areas. The small amount of excess material removed was bladed into the adjacent unprocessed lane. Care was taken during "hard

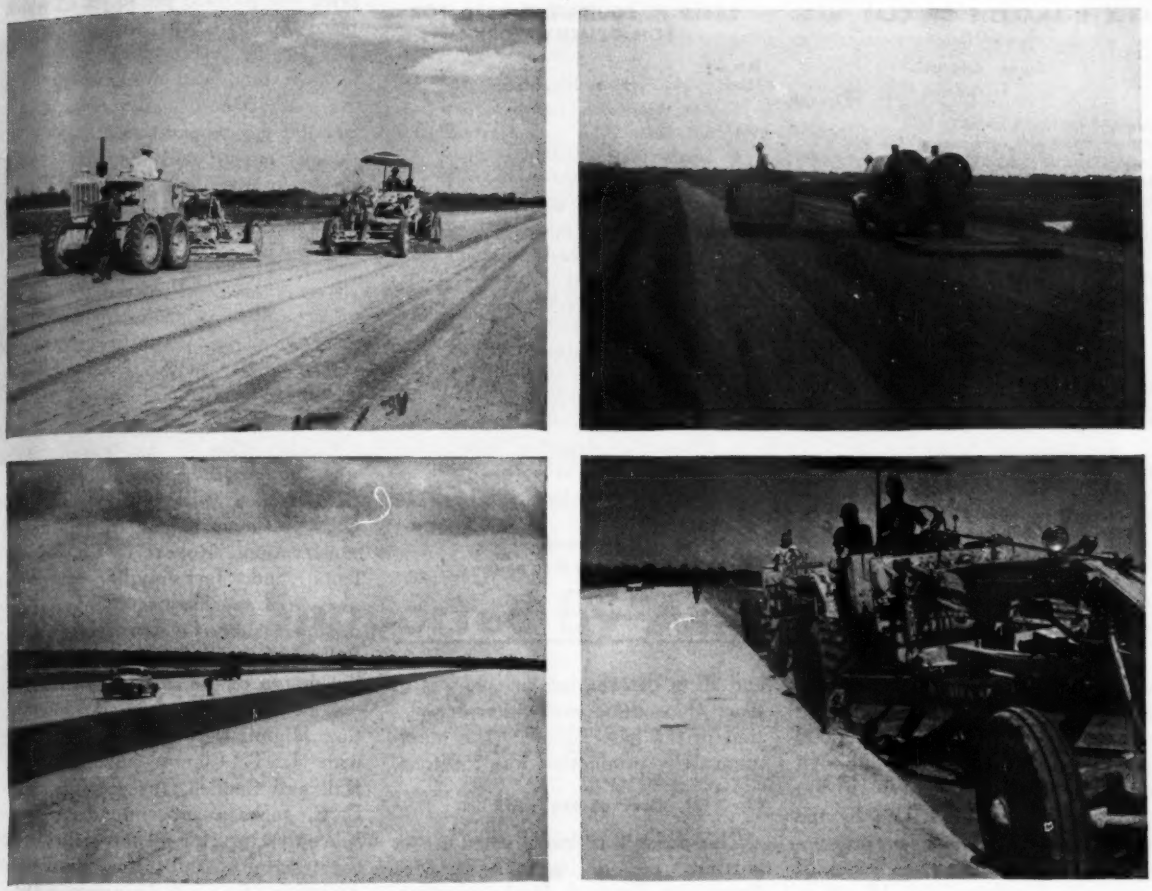

Fig. 2. Upper Left: Motor graders did the final shaping, the excess material being bladed into an unprocessed lane. Upper Right: Graders were followed by drag brooms and smooth rollers, which in turn were followed by pneumatic-tired rollers. Lower Left: Completed soil-cement base for a runway, one lane having already been primed to reduce moisture loss from the pavement. Lower Right: A 28-in. dia. disk mounted on the end of mold board of a motor grader proved an excellent tool for trimming the longitudinal edge of a completed slab.

blading" to eliminate low areas, and the surface was checked before compaction with the pneumatic rollers to make certain it was either on, or slightly above, the specified grade.

When the final grade was completed and checked, the section was cover-rolled with a single trip of a 6-ton, steel-wheeled, tandem roller. Moistened, if necessary, the base was then given the complete and final rolling with the rubber tired rollers.

Optimum moisture maintained

The moisture content during the entire compaction period was maintained at the optimum by the addition of as many light "fog" shots of water as were necessary. The A.S.T.M. test D-558-40T was followed in determining the optimum moisture and theoretical maximum density, the test being conducted with a moist-mixed sample obtained from the processed section at the beginning of the compaction operations.

Retention of moisture in the soil-cement mix during the early stages of hardening was assured by early application of either an RT-2 tar or an asphaltic emulsion. The tar was applied at the rate of about 0.18 gal. per sq.yd. and the emulsion at 0.15 gal. With the clay-marl soil it was found that the bituminous emulsion could be applied the day following processing, whereas the best results with the tar prime was obtained by allowing the soil-cement to harden about three days. In the latter case, the soil-cement surface was kept moist by "fog" applications from the pressure distributor during the three-day period. The application of the bituminous materials served both as an aid to curing and as a prime coat for the wearing course.

After the soil cement had hardened for a period of ten days to two weeks, the treated area was surfaced with a hot bituminous mix at the rate of 130 lb. per sq.yd., or about 1½ in. thick. The hot mix was composed of a 50-50 blend of local sand found near the property and manufactured limestock screenings to which approximately 8 percent by a weight of 50-60 penetration asphalt cement was added. This mixture was prepared at a central mixing plant, hauled by truck to the runways, distributed with a mechanical spreader of the tamping type, and thoroughly consolidated with 5- to 8-ton tandem rollers supplemented with pneumatic-tired rollers.

Processing of the soil-cement was completed after 127 days of elapsed time from the date operations began, although the contractor was able to work only 44 percent of the total elapsed time because of what was

TABLE I. ANALYSIS OF CLAY MARL SOIL

Sieve Analysis

	Percent
Retained on No. 4 Sieve	2
Passing No. 4 and retained on No. 10	3
Passing No. 10 and retained on No. 60	14*
Material above No. 60	19
Passing No. 60 and retained on No. 270	60
Silt and clay of less than 0.05-mm dia.	21

*Practically all material above the No. 60 size is composed of weathered shell fragments.

Physical Constants

(Material passing No. 40 sieve)

Liquid limit	23 percent
Plasticity index	2 percent

Chemical Properties

Silica and insoluble iron and aluminum	78.8 percent
Calcium and magnesium carbonates (by difference)	21.2 percent

Moisture-Density Properties

Optimum moisture content	14.5 percent
Maximum density	119 lb. per cu. ft.

TABLE II. EQUIPMENT USED FOR SOIL-CEMENT WORK

No. of Units	Type of Machine
1	8-ft. rotary tiller (self-powered)
1	6-ft. rotary tiller (power take-off)
1	Single shaft, 13-bladed, 25-in. disc harrow
3	9-ft. offset, 24-in. disc harrow
2	8-ft. rigid-tooth cultivator
1	5-bottom gang plow (mounted on road machine frame)
2	Motor grader (12-ft. blade)
1	118-hp. track-type tractor
2	80-hp. track-type tractor
1	50-hp. track-type tractor
2	15-hp. rubber-tired tractor
2	40-hp. track-type tractor
4	Double-drum sheepsfoot roller
2	Multiple-wheel, rubber-tired roller
5	1,000-gal. water truck with spray-bars attached
1	6-ton steel tandem roller
1	10-ft. spike-tooth drag harrow
1	10-ft. drag broom
4	1½-ton truck

locally called the "rainy season." Average production in constructing the 6-in. base course was about 7,000 sq.yd. for the days worked, although peak production was over 10,000 sq.yd. The equipment used by the contractor for the soil-cement processing work to permit this rate of progress is listed in Table II.

Placing of the hot bituminous wearing surface began several weeks after soil-cement operations started, and all of the wearing surface was in place about three weeks after completion of the base course. The maximum daily production was 750 tons.

Cost of the work

The field was constructed as a portion of a cost-plus-fixed-fee Bureau of Yards & Docks contract, but all paving work was sublet on a unit-price basis. For the soil-cement base course, the completed price was $0.6955 per sq.yd. of which price $0.2975 was for processing, $0.1100 the cost of importation and placing the marl borrow, $0.2530 the cost of the cement in place, and $0.0360 the expenditure for the bituminous curing and the prime coat. These figures do not include overhead, engineering services, fees, etc.

The price for the wearing course was $5.50 per ton, which included all costs involved in the furnishing of a completed wearing surface. This price when reduced to a square-yard basis equals $0.3570, making the completed pavement cost $1.05 per sq.yd.

Construction of the landing field was under the direction of Lt. Comdr. George T. Swiggum, CEC, USN, resident officer in charge of construction. Robert & Co. of Atlanta and Jacksonville, prepared plans and specifications and assisted in supervision of construction. A. P. Bolton of the Robert firm developed the design of the soil-cement base.

Matt & Sinclair and Belcher Oil Co., Miami, were prime contractors, with J. T. Clamp superintendent. Hall and Caddell, Jacksonville, with E. E. Jackson superintendent, were subcontractors for all the soil-cement construction, and the Interstate Amiesite Co., Wilmington, Del., H. H. Davidson superintendent, were subcontractors for the bituminous wearing course.

Fig. 3. A completed runway, after the soil-cement base was covered with 130 lb. per sq. yd. of hot asphalt as a wearing surface. Cost of the soil-cement base and 1½ in. asphalt surface was about $1.05 per sq. yd.

Fig. 1. Laboratory model, 12-ft. dia., of air supported roof. Roof was built flat and expanded by a pressure of 3.31 psi.

Roofs Supported by Air Pressure

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***Contents in Brief**—Tests on a 12-ft. dia. model have indicated the possibility of constructing a 300-ft. dia. building without interior columns and with the roof supported by a fraction of a pound per square inch of air pressure. Neither unsymmetrical loading nor wind tunnel tests disclosed undesirable features. Details of an air-supported roof over large grain storage, built in 1934, is reported for the first time.*

ELIMINATION of roof supports to provide large covered areas without interior obstructions has long been a goal of structural designers. The objective has been achieved, at least in part, by long spans, cantilevers, a spheroid tank design and other structures. A relatively new scheme—intensively investigated recently—is support of roofs by air pressure. There is a record of at least one successful use of the method on a commercial scale.

Recent tests on a 12-ft. dia. laboratory model of a 300-ft. dia. structure indicated the possibility of using thin, 22-gage steel sheets, for a roof erected flat, expanded and raised at the center by air pressure. The pressure required for the proposed structure is relatively low, perhaps 40 psf. (pounds per square foot) to stress the sheets beyond the elastic limit and force them into a dome shape. After the original forming, the pressure required to hold the roof would be only 20 psf. (about 1/7 lb. per sq. in.), insufficient to be noticed by people working inside.

Tests on 12-ft. prototype

The 12-ft. dia. model was built on a 12-in. thick concrete base, using 28-gage galvanized steel sheets, with soldered seams, for the roof. The prepared cover was soldered to the top of a 4-in., 6.25-lb. steel channel which was curved to 12-ft. dia. and embedded in the concrete. In addition, the roof cover was clamped to the channel by a heavy steel ring held by machine screws at about 3-in. spacing.

When the model was inflated far beyond the yield point of the metal the shape, at the greatest deflection, was very smooth and uniform. Some small wrinkles, which had existed at the start of the test, were ironed out and the seams did not appear to cause any irregularity in shape. The shape at various pressures is shown in Fig. 2; the shape of the model at 7.44 in. upward deflection and 3.31 psi. pressure is shown in Fig. 1.

Deflections were read on drill rods operating in guides, using Ames dials reading to 0.001 in. Strains were obtained using Baldwin-Southwark SR-4 metalelectric strain gages on both inside and outside of the sheets. The measured stresses were somewhat erratic, although in a general way they conformed to the theoretical values. It was concluded that the differences were due to small initial irregularities in form, which could not be avoided in fabricating the model, and perhaps to a smaller degree, to slippage of joints. The strain gages gave highly accurate results, measuring stresses to within about 1 percent. The gages were used also in making stress-strain measurements on coupons of the steel sheets. Lateral as well as longitudinal strains were measured, both below and above the yield point.

Unsymmetrical loads, amounting to about 600 lb. of lead in bags, were placed to simulate various unfavorable loading conditions and the accompanying stresses determined by

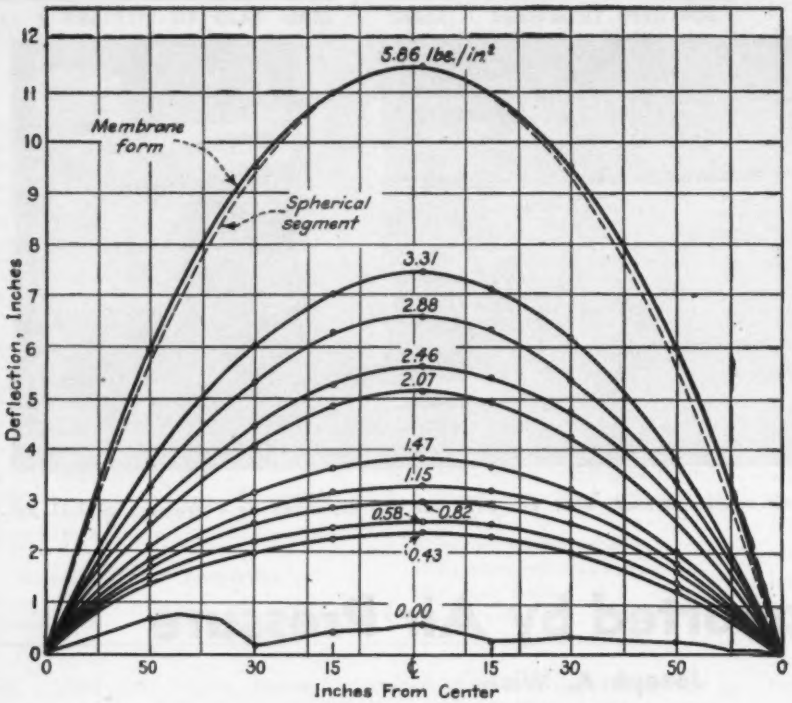

Fig. 2. Upward deflection, under pressure, of 28-gage (.0153 in.) galvanized steel sheet roof of 12-ft. laboratory model. Note that the shape of the model at all pressures was smooth and uniform.

the strain gages. Even at very low air pressures the model sustained these loads with very little deflection. Stresses did not change signficantly and, while a small amount of local flexure occurred, the net effect was a slight reduction of the membrane stresses.

Originally planned for 1,200-ft. dia.

In 1942, Herbert H. Stevens, Jr., a consulting research and development engineer for the John B. Pierce Foundation, proposed the idea of forming a dome-shaped roof by applying air pressure to a flat steel sheet and inflating it beyond the yield point. Subsequently, the roof was to be supported by lower air pressure. The original proposal was based on a 1,200-ft. dia. building with a roof 0.049 in. thick fastened to a concrete ring girder built on the ground. The roof was to be inflated until the rise at the center was 60 ft. However, it was believed that this form of roof would waste considerable space and serious difficulties were presented with regard to entrances.

A detail study was made for the 300-ft. dia. building with a roof of 22-gage (0.0306 in.) steel sheets supported by a reinforced concrete ring girder at the top of a 12-ft. wall, as shown in Fig. 3. The rise of the roof at the center, measured above the top of the wall, was 15 ft. The roof could be erected by initially curving it on falsework, or it might be inflated from a flat sheet built on a platform

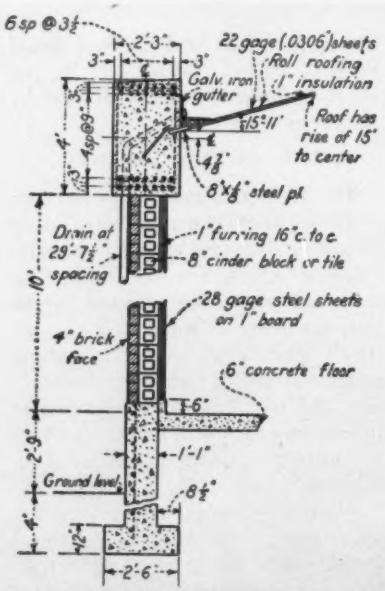

Fig. 3. Section through wall of proposed 300-ft. dia. building with roof to be supported by 20 psf. air pressure.

at the level of the top of the wall. Another possible scheme of constructing the roof was to weld the sheets on the floor, raise the assembly to the level of the top of the wall, and then inflate the structure.

The normal pressure required to barely support the roof and keep it stretched tight was computed at 20 psf., while the pressure required to form the curved roof from a flat sheet would be about 40 psf. The former figure is substantiated by use of a pressure of 1½ oz. (13½ psf.) found necessary to support an air filled bag used as a form for a coating of pneumatically applied mortar in construction of a 100-ft. dia., 32-ft. high concrete dome. (*ENR*, Aug. 10, 1944, vol. p. 143).

Other model tests

Construction of the 12-ft. dia. model was preceded by tests on a 40-in. dia. steel membrane model built in the laboratory. A single 28-gage (.0153 in.) blue annealed steel sheet brazed to a ⅜-in. steel base was tried. This was found unsatisfactory, due to warping produced by the heat, and a second 40-in. dia. model was built with edges held by a clamping ring and machine screws. Deflections obtained checked with the theoretical computations almost exactly. Strains and stresses, obtained with SR-4 strain gages, were somewhat erratic, believed to have been due to the fact that the strain gages were used on the outer surface only. Gages were used subsequently on both surfaces of sheets being tested.

Comprehensive studies were made in the New York University wind tunnel on a 5-ft. dia. mahogany model at wind speeds up to 80 mph. Studies included the effect of placing the dome on a wall, and also the effect of various obstructions in front of the building. The wind forces were chiefly negative, that is, they tended to lift the roof, and only near the leading edge and far edge were there any positive or downward forces. The model test gave results in agreement with theoretical values recently developed by Ralph H. Upson, aeronautical engineer for H. J. Heinz Co.

A "flutter" model of .001-in. thick copper foil, 30-in. dia. soldered to a ⅜-in. base, was tested in the wind tunnel at speeds up to 70 mph. With zero internal pressure a slight tremor,

which could be called flutter, was observed. However, with the smallest measurable internal pressure all flutter disappeared completely, even at the highest wind speeds.

Tests were made on structure models with roofs of cellulose acetate film, .0013 in. thick, and they were found to behave similarly to the steel model. Tests were made on the behavior of supporting ring-girders by employing $\frac{3}{16}$-in. square rods bent into circular forms of various diameters up to 40 in. and one elliptical ring. By gluing two cellulose acetate membranes to these rings and applying air pressure between them, a large radial force was applied to the rings. No tendency to buckle was observed; in fact, although the ring might have been initially buckled due to irregular shrinkage of the film, when pressure was applied the ring resumed a plane form with no tendency to buckle.

Air-support idea is new

The idea of using air, under comparatively low pressures as a structural material to support a lightweight cover is relatively new. A scheme of using balloon cloth structures, inflated by centrifugal fan blowers, for tents for field hospitals and the like, was developed in 1917 by Lanchester, an Englishman, but there is no record of any structure of this type being built. The general scheme has been used frequently in recent years in balloon-type forms for pneumatically applied concrete structures.

Application of the air-support idea to metal roof structures first appeared about 1934. John H. MacMillan, Jr., now president of Cargill, Inc., Minneapolis, experimented with an 8-ft. dia. cylinder with hemispherical ends and riveted seams, made of 30-gage steel sheets. Finding that comparatively low pressure sufficed to produce remarkable rigidity, Mr. MacMillan designed and erected a 70,000-bu. grain storage building using 22-gage galvanized steel sheets, connected by brazing. The author was consultant on the project.

Essential features of the design of this structure, which is 250 ft. long, 50 ft. wide and 25 ft. high are shown in Fig. 4. It is interesting to note that the footings were designed primarily to hold the building down rather than to support its weight. The

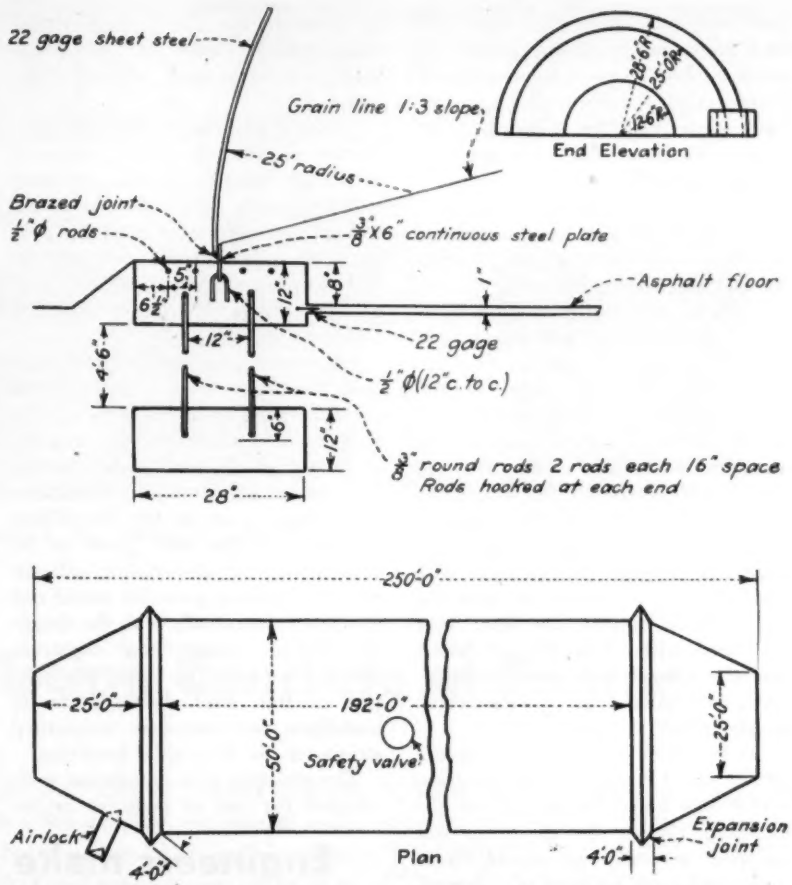

Fig. 4. Grain storage shed with air supported roof was built at Minneapolis in 1934. Cost was 11c. per bushel of storage.

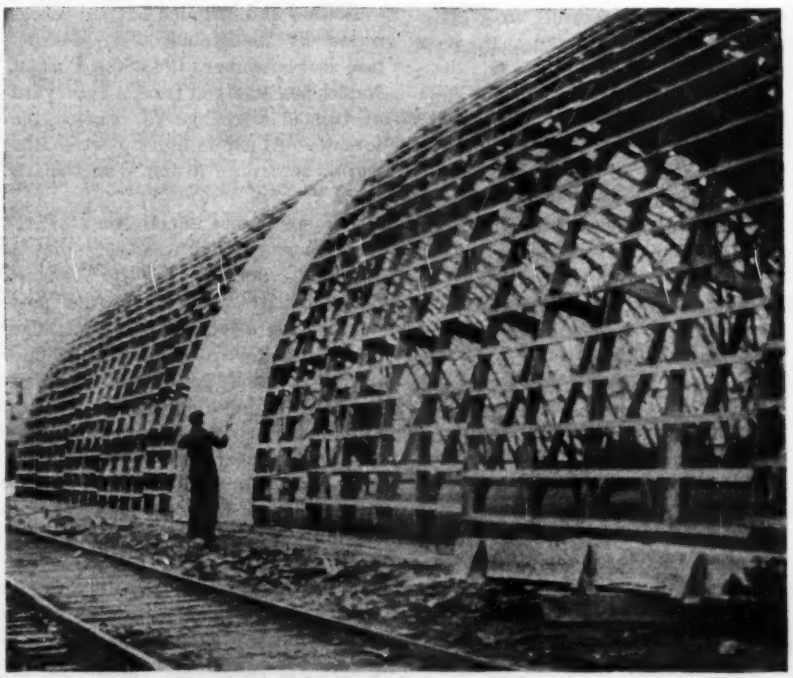

Fig. 5. Steel sheets were placed over temporary falsework in erection of grain storage building.

roof was erected over light falsework and when completed was inflated by using a 7½-hp., 2-psi. compressor. Air leaked through various places so rapidly, principally the 1-in. thick asphaltic concrete floor, that not over 18-psf. pressure could be obtained. It was found necessary to add 30-gage galvanized steel sheets, soldered together, over the floor and to place an asphaltic concrete wearing surface on top of this. After sealing other leaks the building was made tight enough so that the design pressure of 70 psf. could be obtained and held, and the falsework removed.

The semi-cylindrical part of the structure was joined to the two truncated cone ends by an expansion joint, made by forming the plates to an inverted V. Entrance to the building was through an air-lock with double doors. A total air pressure of 1,000 lb. against the door kept it closed without latches or locks; however, this pressure could be equalized, by means of an air-lock portal, in about half a minute.

At the comparatively low pressure of 70 psf. (½ psi.) no physiological effect was noted by anyone in the building. When the air pump was stopped, several hours would elapse before pressure dropped to a dangerously low value. A safety valve—simply a manhole cover weighted to 70 psf. and operating in a cylindrical guide—was placed at the crest of the roof.

The structure sustained heavy snow loads and wind forces without distress and was considered a successful demonstration of the possibility of supporting thin-sheet metal roofs by air pressure alone. Cost of the building was very low, even though it was of an experimental nature. Based on 70,000-bu. grain capacity, the total cost was less than 11c. per bushel. After about a year the building was dismantled because it was found that grain dust remained suspended in the air to an extent that constituted an explosion hazard.

Economical for a few applications

From the studies at New York University it may be concluded that it is possible to inflate a flat sheet to form a dome-shaped steel roof and it is possible to support such a roof by air pressure. It also is possible to construct a roof on falsework to an initial dome shape, and support it by air pressure thereafter. Such roofs, when properly designed, can resist snow and wind loads without difficulty.

If the roof is built flat and then shaped by inflation, higher pressures and larger fans are needed, and there will be greater difficulties due to air leakage. In either case, adequate provision must be made for accurate control of pressure, particularly to guard against effects of rise in internal temperature.

For some purposes, where large open floor space is of value or where the almost sealed-in character of the building is of advantage, the pressure supported roof may prove useful. For very simple, tent-like structures for storage, such as the MacMillan structure, it also may prove to be economical, but the studies indicate that the building probably would not compete economically with the cheapest possible conventional construction for storage. The factor of corrosion of thin steel sheets limits its usefulness to somewhat temporary structures in favorable localities.

The structure does not appear well-adapted for use in factories or industrial plants where frequent entrance and exit of personnel or material is required. And the thin-sheet roof cannot be considered highly fire-resistant. It is not recommended for use where many people would be present, unless special provisions are made for emergency exit.

The research work at New York University was sponsored by the Office of Production Research and Development of the War Production Board, Consumers Products Branch. The staff and an advisory committee of the College of Engineering of New York University assisted in the studies and in consultations on special phases of the work. The Chicago Bridge & Iron Co. assisted with information on behavior of balloon roofs and welding for thin sheets.

A comprehensive report on the project has been made to the War Production Board, copies of which are available for inspection also at New York University.

Herbert H. Stevens, Jr., was project manager and the writer (on leave from the University of Minnesota) was director of the experimental project at New York University.

Engineers make Naples Foremost Allied port

Blasted and crippled beyond recognition by methodical Nazi destruction in September, 1943, the Port of Naples has emerged from a graveyard of twisted wreckage to become the foremost Allied military port in the world, according to the War Department.

The speed and effectiveness of Allied reconstruction was such that a scant three months after the Germans fled the city on Oct. 1, the port handled more tonnage than the huge New York Port of Embarkation, and in the six-month period from October to April, it handled 2,375,229 long tons of cargo—a figure just short of the previous peacetime record for that port during the full year of 1939.

Periodic sniping still continued in the outlying streets of the city, when Brig. Gen. Arthur W. Pence, commanding general of the Peninsular Base Section, led an advance echelon of the 1051st Engineer Port Construction and Repair Group and the Transportation Corps' Sixth Port Headquarters to the stricken port. They began a careful survey of the area and formulated plans of rehabilitation. Within 24 hr. of their arrival the actual work began. Engineer troops were put to work clearing the essential traffic lanes between piers. Mine sweepers were brought in. Sounding parties explored all channels. Divers were lowered into the water to estimate the extent of the damage at all berths where any hope of rehabilitation seemed possible.

The skill and ingenuity of the Engineers was brought into play in utilizing sunken vessels as foundations for emergency piers. Instead of attempting to refloat or remove the many large ships which lay on their sides, the Engineers bridged them—an operation which saved months of work. A tanker, on even keel, was cut down to deck level to provide a full-length berth for a Liberty ship. In other instances, standard Navy lighterage ponton gear was used so other Liberty ships could dock and discharge their cargo. Other problems were solved by equally ingenious methods.

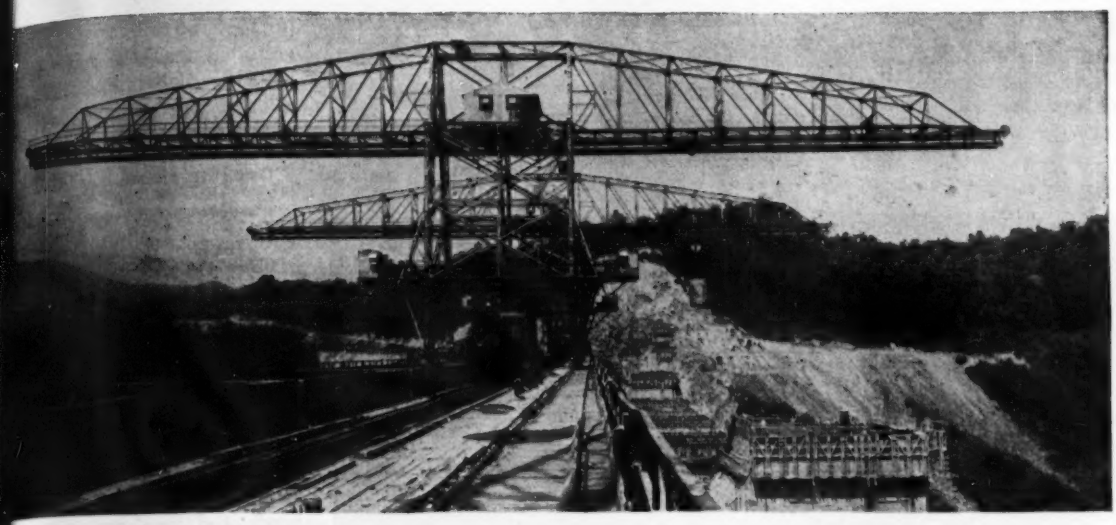

Fig. 1. First use of hammerhead cranes in the Tennessee Valley was on the 2,800,000 cu.yd. Fontana Dam.

Mixing and Placing Concrete at Fontana

***ntents in Brief**—To place upward of 200,000 cu.yd. of concrete a month nessee Valley Authority forces used two hammerhead and several large olving cranes on the 2,800,000-cu.yd. Fontana Dam. Belt conveyors car- job-made aggregates to the mixer plant and concrete away from it to e construction levels for delivery by rail to placing units. A 4-cu.yd. ket that dumped in 2 sec., and material boxes that contained everything ded to prepare a "lift" for concrete were time saving ideas perfected.*

ED IN PLACING CONCRETE was the minant goal in the planning and struction of Fontana Dam now rly completed by the Tennessee ley Authority. The dam, fourth gest in the world in concrete vol- e, is on the Little Tennessee River western North Carolina. More than ft. high, the gravity-section struc- e required the placing of about 00,000 cu. yd. of concrete which s achieved in about 20 months.

Construction planning was based placing 8,000 cu. yd. of concrete day, or more than 200,000 cu. yd. good months, and all of the plant ts were designed to achieve this ective. Actually, the planned ca- ity production was far exceeded h a record day of 10,755 cu. yd. l a record month of 243,000 yd., on a 6-day week basis.

The site selected for the dam is in deep gorge of the river with high k bluffs on either side rising to well above the height of the projected dam. Such a condition indicated a possibility of using cableways for major concrete and material handling. However, a sufficient number of cableways could not be concentrated over the small construction area to meet the projected schedule so, for the first time on TVA construction, hammerhead cranes were used for concrete placing. Among other construction innovations were perfection of a 4-cu. yd. bottom-dump concrete bucket that can be dumped in 2 sec., introduction of a combined materials and muck box and simplification of cantilever forms. For design innovations see *E.N.R.* Nov. 16 '44 p. 97.

The dam is in an isolated area of mountainous terrain with little space available for shops or storage. An existing branch line railroad, running to a copper mine a short distance upstream from the dam, was extended to partially serve the construction. However, the railroad was of limited capacity and only a small area for trackage could be developed at the dam. A job access highway was built to high standards of grade and curvature but it connected only to mountain roads.

Aggregate made at site

Securing aggregates for the concrete was an early construction problem. TVA opened its own quarry for production of both fine and coarse aggregates from quartzite available within a mile of the dam. Trucks hauled from shovels in the quarry to primary crushers. From that point until it reached the dam as concrete the aggregate moved on belt conveyors. More than two miles of these dependable units carried the aggregates across the Little Tennessee River twice, to take advantage of space for processing and storage on the opposite side, then for a distance around a dog-leg bend of the river and to the top of a mixer plant.

Concrete for nearly all operations on the 2,800,000-cu. yd. project was prepared in a single mixing plant, located on the mountainside about mid-height of the dam. The unit was housed in an octagon-shaped building that contained eight bins around

MARCH
SCHEDULE 190,000 cu. yds.
PRODUCTION 194,189 cu. yds.
APRIL
SCHEDULE 210,000 cu. yds.
PRODUCTION 211,101 cu. yds.
MAY
SCHEDULE 240,000 cu. yds.
PRODUCTION 243,764 cu. yds.
245,000
JUNE 1-3 9200 3067 767 100
JUNE 5-10 9350 3117 779 102
JUNE 12-17 9500 3167 792 103
JUNE 19-24 9500 3167 792 103
JUNE 26-30 9460 3153 788 103
245,000 CU. YDS. IN JUNE IS A TOUGH SCHEDULE
WITH THE SAME DETERMINATION YOU HAVE SHOWN IN PAST MONTHS IT CAN BE MADE

Fig. 2. Bulletin boards, such as this, developed job interest and inspired rivalry between working shifts to an extent that most schedules were exceeded.

its outside, and had a capacity of 1,200 tons, enough to operate the plant for a little less than an hour. This structure was available when procurement of new steel was doubtful, so it was used despite the limited storage for so rapid a schedule. About 1,500 bbl. of cement could be stored in two bins in the center of the plant.

Cement blown 3,000 ft.

Cement came to the job in bulk, in box cars, and was unloaded upstream from the dam by manually-operated power scrapers. These dumped into hoppers from which the cement was carried by enclosed chain-flight conveyors to three surge tanks above three air-activated cement blowers. The blower units forced the cement through 6-in. lines for a distance of 3,000 ft., including a 300-ft. vertical rise, to four 6,000-bbl. cement silos. From the silos, cement was blown to the mixer plant by three additional air-activated conveyors. Capacity of the cement plant was about 9,500 bbl. per day, however this proved inadequate when the job forces maintained production at a rate of more than 10,000 cu. yd. of concrete for many successive days. Temporary cement handling facilities were added nearer the plant to accommodate peak production.

Six aggregate and sand batchers, two cement batchers and a water batcher were suspended under the bins in the mixer plant and filled by gravity from storage above. They discharged, through a turnhead, into any one of five 4-cu. yd. front-charge tilting mixers. The plant was entirely automatic with batching and mixing each controlled by one man.

Concrete was dumped through a central cone to a 42-in. conveyor belt that fed to a series of belts to take the concrete either up or down to three construction levels. The first belt had an upward slope of 13 deg. and operated at a speed of 216 ft. per min. to carry 400 cu. yd. per hr. According to W. R. Johnson, concrete technician, this conveyor would satisfactorily handle concrete with a maximum slump of 3 in.; wetter concrete had a tendency to flow back down the belt and spill over the edges.

Beyond the first conveyor at the mixer plant the width of the belt was reduced to 36 in. and speed increased to compensate for it. Speed was adjusted also to the slope—belts carrying concrete upward operated much faster than those sloping down. For the moderate slump concrete used in the later stages of the project and for the large aggregate,

CONCRETE BELTS AT FONTANA DAM

Width Inches	Slope	Speed ft. per min.
42	+13°11′	216
36	+13°11′	600
36	− 7° 8′	400
36	−10°54′	350
36	−10°54′	477
36	+13°28′	629

up to 6-in. cobbles, job forces gest that the belts might pro have been wider; limitations on cal materials, however, require of minimum belt and idler width

Concrete placed from three le

Full revolving and hammer cranes on self-propelled ga operated from trestles at three to place concrete in the more 470-ft. high dam. One trestle wa above the powerhouse where o two revolving units placed co in the toe of the dam and ser the powerhouse. The second tr known as the "low-level," althou was about 230 ft. above ave foundations, carried both ham heads and revolving units on gage rails and supported three tr for trains hauling concrete.

After concrete reached the he of the low-level trestle the deck raised 204 ft. to permit comple of the dam. The trestle center in the raised location was exactly that of the first position, but the ports were entirely separate, and on the completed concrete.

Concrete was delivered to cranes in 4-cu. yd., bottom-du buckets set four in a row on a cially built flat car that had sp for a fifth bucket available. Buck were loaded from a transfer hop at each level and were kept filled direct delivery from the concr belts. Hoppers at each transfer po had two compartments for 6-in. c ble mass concrete and two for 3- cobble face concrete. An improvi tank handled the grout. Air-operat gates under each of the compartme opened to fill each of four buck in about 15 sec. as a single car tra pulled by a diesel locomotive, pass under the hopper.

Loaded trains moved out on t trestles where an empty bucket w set on the car and the car was th moved to spot a full bucket of t right kind of concrete under t crane hook. As soon as a cra picked up one bucket the train mov to another crane where anoth empty bucket was exchanged for full one. If four cranes were placin concrete the train usually supplie one bucket to each of them as th had been found, by observation of method study group, to be most eff cient. It avoided blocking trains b the unit standing at a crane until a

buckets were emptied, then all trains returning at one time and causing loss of time at the loading point.

The 4-cu. yd. buckets used are bottom-dump, air-operated, self-closing units (Fig. 3) designed by the Construction Plant Division and built by the construction department of TVA. Buckets are dumped by inserting a nozzle into a socket provided near the bottom to actuate an air ram. The air ram unlocks and moves the latching system only a very short distance but this throws the gate controls over "center" and permits the entire bottom of the bucket to open as two hinged gates. The operation of opening, discharging and closing the bucket requires less than 2 sec.

The buckets are 6 ft. in. dia. overall and about 8 ft. high, with all the machinery entirely enclosed. The gates open to give an entirely unrestricted discharge through a 4x3½-ft. space. The gates, including closing counterweights, operate entirely inside the 6-ft. dia. and are protected from damage by the heavy steel shell of the bucket. Thirty such buckets were built, by assembly-line methods, in TVA's machine shop at Fort Loudoun Dam for the Fontana job.

Hammerhead cranes new to TVA

Two hammerhead cranes were purchased new for this project. The units have a horizontal reach of 300 ft.

COMPARISON OF OPERATING TIME OF HAMMERHEAD AND REVOLVING CRANES.

Load of 4-cu.yd. concrete bucket—full when lowered, empty when raised.

	Vertical Distance, ft.	Av. lowering time sec.	Time per ft. to lower, sec.	Av. hoisting time, sec.	Time per ft. to hoist, sec.
Hammerheads	143	26.4	0.18	14.3	0.10
Revolvers	113	24.1	0.21	23.9	0.21
	168	36.6	0.22	34.9	0.21

and thus have been able to place concrete any where in the dam except in the toe of the lowest blocks. Principal advantage of the hammerheads is speed at hoisting and smoother operation in spotting heavy buckets in the forms as the buckets travel in a straight line rather than a circle.

The hammerhead cranes have regenerative braking in which the motor acts as a generator when lowering loads. Special controls are provided that adjust the speed of raising or lowering loads to the weight handled so that for each movement the motor is loaded to its full capacity as either a motor or a generator.

The hoisting equipment is fundamentally a direct-current shunt-wound hoist motor powered by an ac-dc motor-generator set with variable voltage control. Two exciters are provided, one a constant voltage compound-wound machine, the other a cross-flux exciter having unusual characteristics in that any increase of current in the cross field causes a drop in the terminal voltage of the exciter. The result is a decrease in voltage of the cross-flux exciter with an increase of motor current, either in the positive (hoisting) or negative (braking) direction.

In operation, the output voltage of the cross-flux exciter is connected across the field of the variable-voltage generator. With this connection the main generator voltage increases as the load on the hook decreases and the load travels at a slower speed. In the hoisting direction the hoist motor stalls when its line current has increased to a value that bucks the exciter voltage (and hence the main generator voltage) to a minimum. Thus the rig automatically uses all of the power or resistance available for handling loads by changing the speed of movement. The crane is safe in operation as it will not lift overloads or move a heavy load along the arm to an overturning position.

A comparison of lowering and hoisting speeds of the revolving and hammerhead cranes is shown in the accompanying table. It will be noted that the advantage of the hammerhead is in the accelerated hoisting speed with a light load, a feature that can be built into other types of cranes.

Placing dry concrete on an unprecedentedly rapid schedule with large

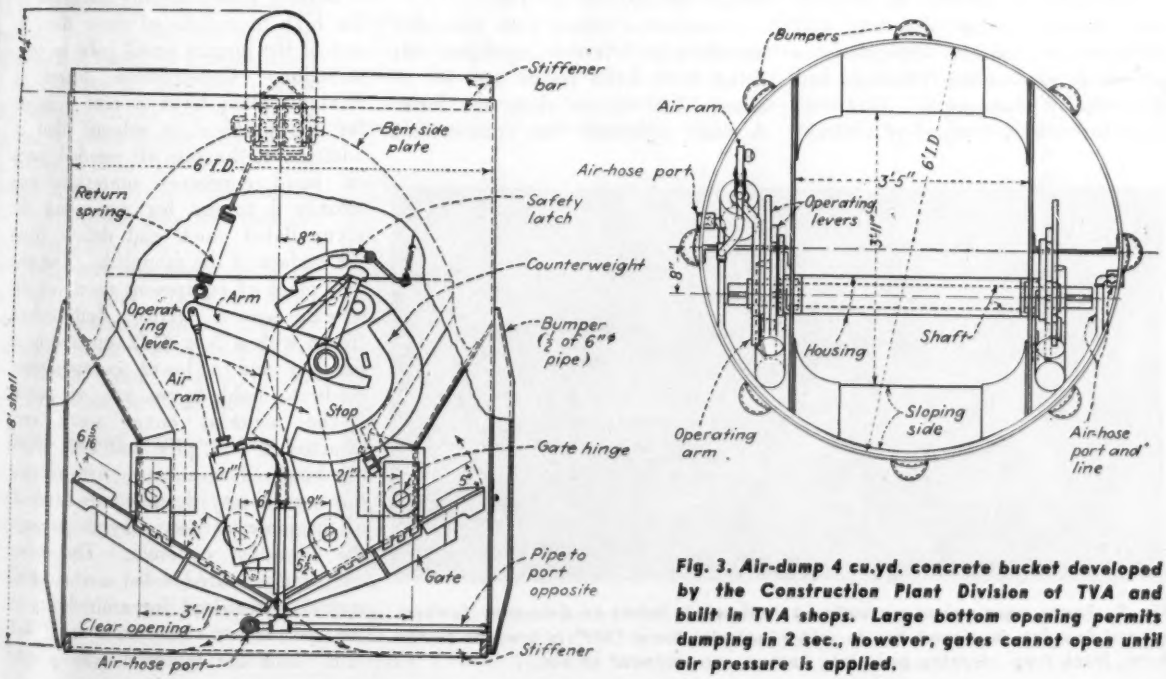

Fig. 3. Air-dump 4 cu.yd. concrete bucket developed by the Construction Plant Division of TVA and built in TVA shops. Large bottom opening permits dumping in 2 sec., however, gates cannot open until air pressure is applied.

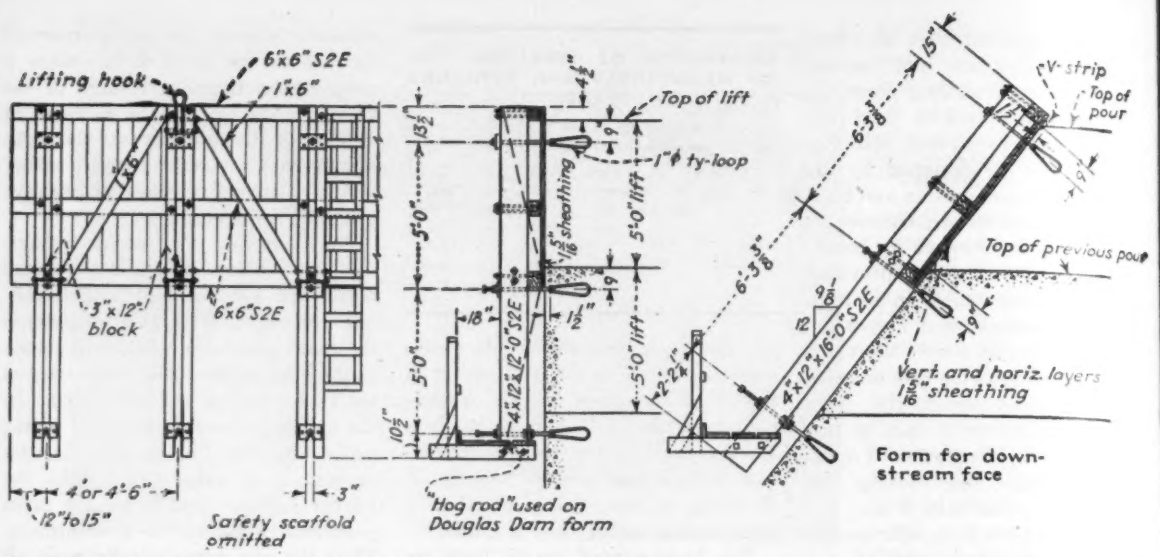

Fig. 4. Cantilever forms were used for Fontana construction to keep the forms free of obstructions to concrete placing.

buckets required that the forms be kept as free as possible from obstruction. To permit dumping buckets near the edges of the blocks, interior form ties were eliminated in favor of cantilever forms. These forms are similar to those used at Douglas Dam, built by the Tennessee Valley Autority (*ENR*, April 22, 1943, p. 562), but do not use the "hog rod". The cantilever forms used by TVA have been adapted and developed largely by Frederick Brandt, assistant general construction superintendent at Fontana.

Tests made at the start of the Fontana project, using the hog rod stiffeners and 3x12-in. vertical wales proved the idea of hog rod sound and theoretically economical. However, if the forms were bumped by a bucket or if the rods became slightly loose the rods lost their value and had to be expertly readjusted to again carry the proper share of the stress. Use of heavier wales took the place of the hog rods on the Douglas Dam forms.

Vertical wales of 4x12-in. timbers support three horizontal 6x6-in. studs that carry vertical $1\frac{13}{16}$-in. D & CM (dressed and center matched) lumber. For all faces of concrete to be permanently exposed an additional layer of $1\frac{5}{16}$-in. D & CM lumber was nailed horizontally over the vertical sheathing. Only this facing had to be renewed throughout the job.

Forms were raised with manually handled pipe A-frames, equipped with roller-chain hand hoists and set at about 12-ft. centers along the form. A study indicated that cranes were losing too much time from concrete placing in moving the hoisting frames from block to block. By using some additional equipment from other TVA jobs it was possible to assign a full set of A-frames to four monoliths having a common corner. The A-frames were raised to each of the blocks as required by a single boom rigged to the form of the highest block of concrete and so situated that it could reach any of the four blocks. Lifting was done with an air hoist.

Material boxes reduce lost time

Getting miscellaneous materials to the high monoliths of mass dams is one of the biggest small jobs on construction. Construction forces at Fontana Dam have a real solution for the problem, a scheme that in addition to having all needed parts on hand conserves materials and affords a means for removing the accumulated muck and debris from the surface of the monolith. The one new piece of equipment used for the scheme was a narrow, double-deck frame with a 3 x 22-ft. open box at the top and a lower compartment made to hold 6 cu. yd. of muck.

The material boxes were constructed of 3-in. pipe and 2-in. wood planking. The upper part of the box was a tray designed to hold all of the material necessary to prepare the form for concrete. The office engineer prepared a list covering all materials required for embedding in the permanent structure for each "lift" and the material was placed

Fig. 5. Forms were raised manually by roller-chain hoists on A-frames. In foreground is a job-developed box in which material for a "lift" is brought to the form. Muck from cleaning goes into bottom compartment of box.

the box by a labor crew. In addition to the permanent materials the required amount of form material is placed in the box — form ties, tie loops for cantilever form scaffolding, J rods for lifting frame anchors, grade and chamfer strips, ice pipe, tie wire, cooling headers, manifolds, hose, air and water service risers and couplings. Oxygen and acetylene bottles were frequently part of the load, as well as reinforcing steel and recess forms when quantities were small.

All items to be placed in the boxes were available at a central point with direct connection to the main construction bridge over the dam. As concreting in a block neared completion, a material box designated for that block was hauled out to where the crane placing concrete could set it down on the block just as placing was finished. Cable slings were permanently attached to the box.

Concrete at Fontana was cleaned after "cutting" (as soon as it had attained its initial set) with an air and water jet. The forms were purposely built high enough that debris from this operation is kept on the block, resulting in considerable muck accumulating. The compartment under the material box was designed to take this muck and it was shoveled in by hand. Pipe legs kept the box well above the surface so cleaning could be done under it.

When concreting was to start, the box was set out by the concrete placing crane and taken to a point where the muck could be dumped. Material remaining in the top was sorted and that in good shape, and needed for the next lift, left in the box. Material that could be reconditioned went to a separate pile and that not salvable to a scrap pile.

The same box was made ready for return to the next lift of the same form. At Fontana placing time for the average block was 3 to 4 hr. so that cleaning and restocking the boxes was done on each shift.

Trestle raised in record time

An unusual feature of the construction was the rapid transition from the low-level to high-level concreting stage. Concreting from the lower trestle was concluded on Nov. 21, 1943 and full schedule work from the high level was underway on Jan. 3, 1944. But concreting on the dam

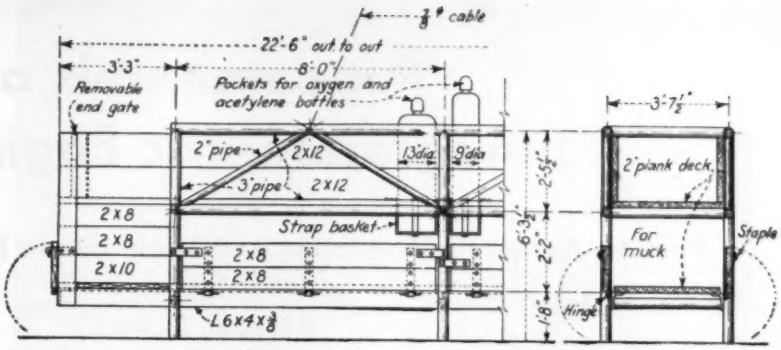

Fig. 6. Material box developed at Fontana Dam to take all necessary materials to a block with one lift of the crane.

was completely stopped only from Nov. 21 to Dec. 6. The high-level trestle required 4,533 tons of steel, of which 1,815 tons was taken from the deck of the low-level trestle. Towers for the high trestle were 40x62 ft. at the base, 40x43 ft. at the top and 204 ft. high. They were erected by traveling derricks operating from the deck of the trestle.

The two 300-ft. arm, 24-ton capacity, hammerhead cranes each weighed 265 tons, and were moved in sections, the largest piece weighing 40 tons. Dismantling required 8½ days for the first one and 5½ days for the second, and erection 14½ and 10 days respectively. The two 50-ton capacity, revolving cranes, each weighing 173 tons were raised much more rapidly; one crane was out of service only four days in being moved from the low- to high-level trestle.

G. E. Murphey, job superintendent, credits the rapid transition from low to high level concreting stage to a complete plan of action prepared in advance by job forces in cooperation with TVA's Construction Plant Division. The latter did all of the detail and analysis work to assure safety and speed of the change. Despite the rapid accomplishment, Mr. Murphey rather apologizes for the time spent, explaining that several days of near zero weather and inability to secure the additional seventy riggers needed to prosecute all operations at top speed delayed full-scale resumption of operation by many days.

Construction of Fontana Dam has been under the direction of C. E. Blee, chief engineer, and A. L. Pauls, chief construction engineer, of the Tennessee Valley Authority. Fred C. Schlemmer is project manager at Fontana Dam and G. E. Murphey is construction superintendent. Frederick Brandt and G. Harvey Gray are assistant construction superintendents. Plant planning was supervised by R. T. Colburn, head of the Construction Plant Division. Oren Reed is construction engineer at the dam.

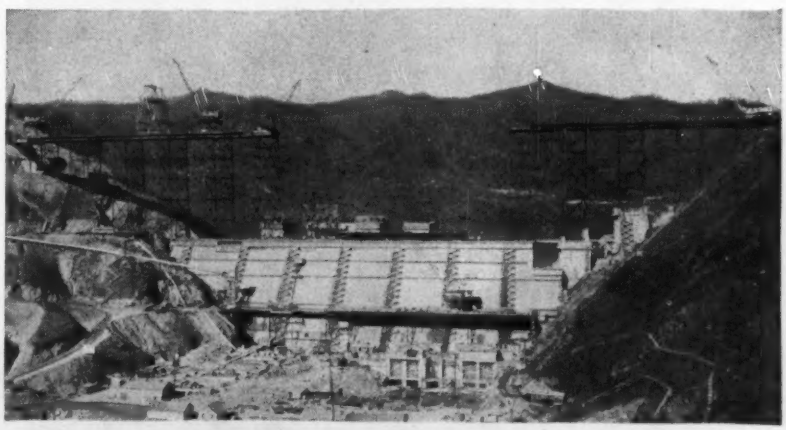

Fig. 8. The construction bridge was raised 200 ft. from "low-level" position, just above the concrete, and made into the high-level structure in less than two months. Concreting on the dam was stopped for two weeks.

Fundamentals of Photogrammetric Engineering

Part I—Aerial Photographs and Their Use in Planimetric Mapping

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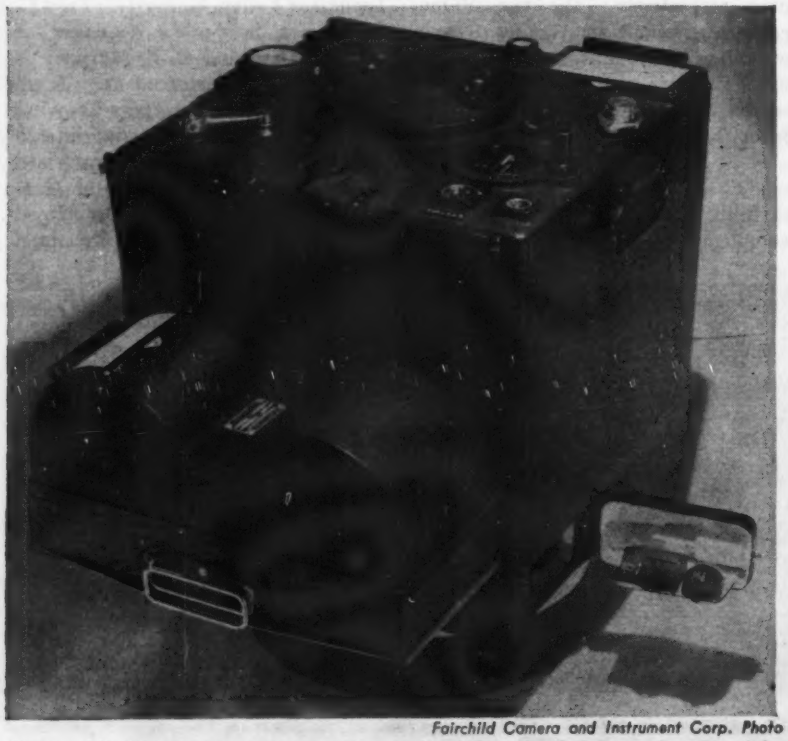
***Contents in Brief**—In presenting the fundamentals of aerial photogrammetry the author discusses aerial cameras, flying procedure and the photographic materials used. The geometric characteristics of aerial photographs are reviewed, with particular reference to scales and the displacements resulting from elevation differences and picture tilt. Construction of radial plot planimetric maps and mosaics is outlined step by step. A concluding article to appear in the Dec. 14 issue will be devoted to topographic and military mapping.*

PHOTOGRAMMETRY, the science in which measurements are made on photographs for some useful purpose, has made tremendous forward strides in the fast-moving war era. It finds applications in many fields, the most prominent of which is the compilation of maps from aerial photographs —in otherwords, aerial photogram metry. This, and a forthcomin article will be confined to a presen tation of the fundamentals, equip ment and working practices of thi highly specialized and rapidly e panding branch of engineering, although aerial photographs ar widely used in such fields as city pla ning, soil conservation, forestry, ta assessment studies, sanitation, etc the discussion of these many interes ing uses deserves special treatmen

For mapping purposes two types aerial photographs are used: vertica —those taken with the lens axis of th aerial camera approximately vertical obliques—those taken with the axi tilted from the vertical to such a de gree that the horizon often appears i the upper part of the photograph.

Verticals are the most widely use type for medium and large scale map ping, while obliques are favored fo small scale reconnaissance mapping Except where obliques are specifically mentioned, the following discussion will concern vertical photographs.



Fairchild Camera and Instrument Corp. Photo

Fig. 1. Fairchild aerial camera having a focal length of 6 in. and a 9 x 9-in. negative size. The film magazine is shown partly withdrawn.

Aerial mapping cameras

A precise aerial mapping camera i illustrated in Fig. 1. The chief com ponents of such a camera are a lens shutter, cone, focal plane frame, film magazine, and winding mechanism.

Lenses used for mapping purposes must give excellent definition, be rela tively free from distortion, and cover as large an angular field as possible. At the present time, lenses having an angular coverage of about 100 deg are available. The focal lengths of lenses used for most mapping work range from 4 to 12 in. The lens, to gether with the iris diaphragm and

tween-the-lens shutter, is attached the lower end of the camera cone. he upper end of the camera cone rms the focal plane frame against hich the film is pressed at the instant exposure. The surface of this ame is very accurately machined d is located at such a distance from e lens that the best possible defini- n is obtained on the negative. The ar aperture of the frame in the odel illustrated is 9 x 9 in.

Located at the mid-point of each de of the aperture is a small metal b or fiducial mark. These marks are positioned that the intersection rmed by connecting opposite marks the resulting print (Fig. 2) locates curately the principal point—that the point where the optical axis the lens strikes the image plane. he location of the principal point is sential in all methods of photogram- tric compilation.

The film magazine (Fig. 1) not ly serves as a receptacle for the two m spools, but also contains the vac- m plate which holds the film flat d presses the edges of the film gainst the focal plane frame at the stant of exposure. Most mapping meras are equipped with an auto- atic electric drive mechanism which dvances the film the proper amount tween exposures, lowers the vacuum ate in position, trips the shutter, d repeats this cycle at whatever me interval the drive mechanism is t for. The proper time interval for y desired overlap is obtained from e view finder. This interval, a mat- r of seconds, is set on an inter- lometer which in turn controls the eration of the camera drive mech- nism.

Flying procedure

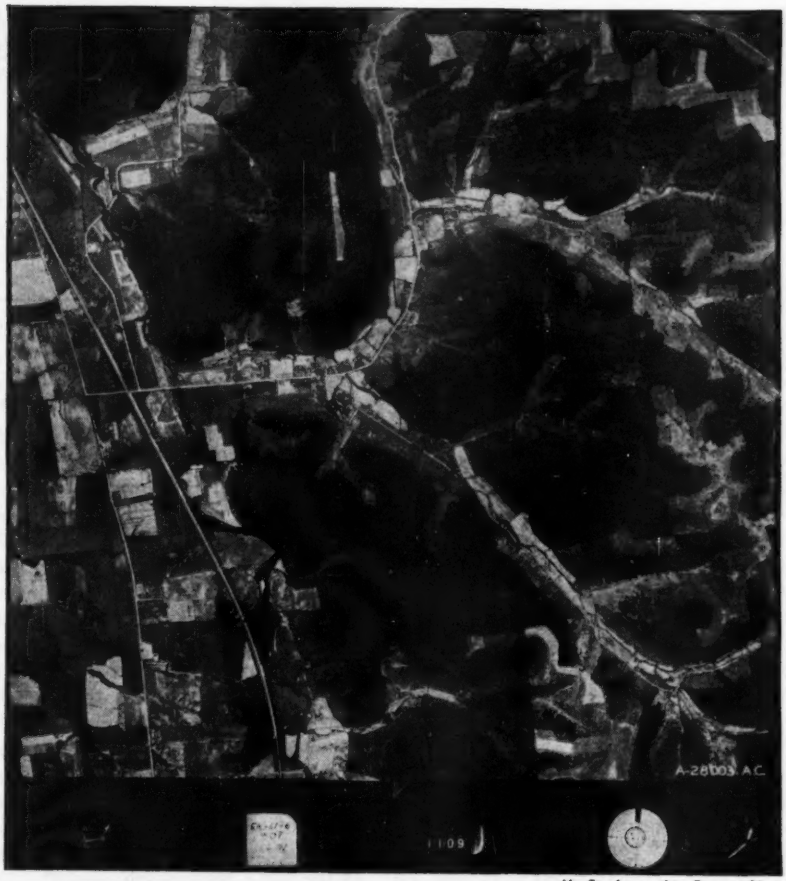
Photographic coverage of an area obtained by flying a series of par- el flights (Fig. 3). The flight sep- ration is planned to give a side-lap about 30 percent to take care of ssible errors in navigation. The posure interval between successive otographs in line of flight is se- cted to give an end-lap of about 60 rcent. This overlap is essential in rious map compilation processes d for stereoscopic examination of e photographs.

Practically all films used for map- ing purposes are of the panchro- atic type. The emulsions of such lms are sufficiently fast so that short exposures can be used, thereby practically stopping image movement on the film during exposure.

Since these films are sensitive to the entire visual spectrum, various color filters can be used with them to reduce the effect of atmospheric haze or to increase the contrast of certain terrain features. For special purposes infra-red and color films are also used, especially for military photography.

The exposed aerial film is delivered to the photographic laboratory for processing on special equipment designed for handling the large rolls (sometimes 250 ft. long) commonly used. Prints differing in scale from the negative are made by projection in an enlarging or ratio-printer. Enlargements greater than four times the negative size are usually avoided because of the resulting graininess of the photographic image.

It is important that the proper type of paper be used for making the prints. For general use, such as for stereoscopic inspection, addition of pencil notes, etc., the ordinary double-weight semi-matte stock is suitable. For any use where accuracy of measurement is essential, a special low-shrink paper must be used. For mosaic work single-weight glossy paper is preferred because its thinness permits stretching to fit control points and its glossy surface is well suited to reproduction purposes.



U. S. Army Air Forces Photo

Fig. 2. Vertical photograph made from negative taken by camera of type shown in Fig. 1. Note the fiducial mark at the mid-point of each side, also the recording devices (watch, data card, number, level and altimeter). Scale as shown is about 1:40,000.

Use of photographs

Although an individual vertical photograph yields much information regarding terrain characteristics, a full appreciation of its value is not obtained until a pair of overlapping photographs are examined under either a lens or mirror stereoscope (Fig. 4). When a composite photographic representation of a large area is desired a mosaic is constructed. The photographic image, whether on

an individual print or a mosaic, shows a wealth of detail not found on any map. However, the interpretation of this detail generally requires considerable experience because of the relatively unfamiliar vertical perspective viewpoint. The map on the other hand shows a limited amount of detail in the form of easily read standard symbols, which emphasize certain desired terrain features.

The construction of maps from aerial photographs falls into two main categories: planimetric maps using radial plot compilation methods; and topographic maps produced by the use of various types of stereoscopic plotting instruments. Accurate maps cannot be made from aerial photographs alone. A number of ground control points are always necessary, the requirements varying with the compilation method used. However, in any case the ground control required will be considerably less than that needed for a map of comparable accuracy compiled by ground methods alone.

Scale of photographs

The scale of a vertical photograph may be expressed numerically (400 ft. per in.) or as a representative fraction (1/4,800). It may also be expressed as the ratio of camera focal length, F, to the flying height above terrain, H-h. Thus, in Fig. 5, ground points A and B are imaged on the negative at a' and b', and on the photograph at a and b. Since photogrammetric measurements are usually made on the positive image—that is, the photograph—it is desirable to

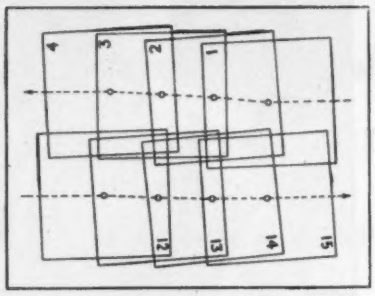


Fig. 3. Part of index map showing how the photographs overlap.

indicate its proper position in the diagram. The scale, S, of the photograph is given by the relation

$$S = \frac{d}{D} = \frac{F}{H-h} \quad \ldots\ldots\ldots\ldots\ldots \quad (1)$$

In this equation H represents the altitude of the plane above sea level and h the elevation of the terrain point in question above sea level. If the ground were flat the scale would be the same in all parts of a perfectly vertical photograph. As this is seldom the case, it is customary to speak of the average scale, which is based on an average elevation, h. From the above equation it is evident that the image of a hill-top on a photograph has a larger scale than a lower point on the same photograph.

The smallest practical scale for a vertical photograph is limited by the ability to recognize desired objects and is seldom smaller than 1:60,000. For any given focal length camera, the smallest scale is also limited by the operating ceiling of the aircraft. The largest scale is limited by the allowable amount of image movement on the film during exposure. For example, with a camera of 6-in. focal length mounted in a plane flying 1[illegible] mph. at a height of 1,000 ft. (scale 1:2,000), the image movement on the negative during an exposure of 1/100-sec. would be about 0.01 [illegible]. This movement makes the accurate identification of image points impossible.

Displacements due to relief

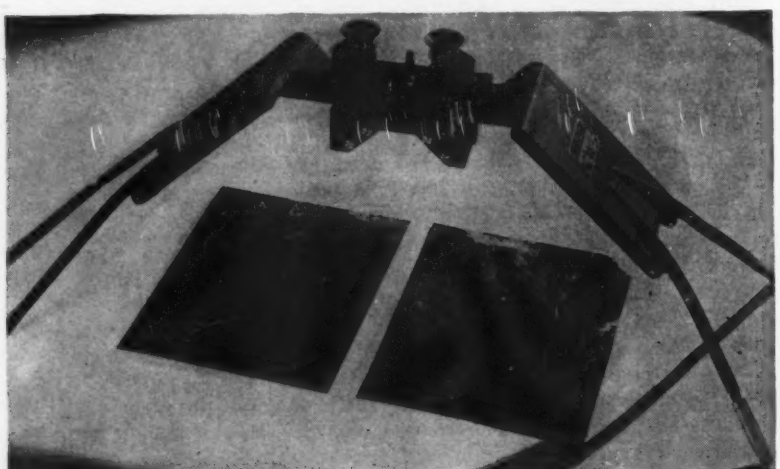
From a geometric standpoint, the chief difference between a map and a vertical aerial photograph is that the former is an orthographic view and the latter is a perspective view (the center of perspective being at the aerial camera lens). If the axis of the aerial camera were perfectly vertical and the terrain were absolutely flat, then the photograph would give map positions directly. However, differences of relief in the terrain introduce relief displacements. Referring to Fig. 6, ground point A is imaged on the photograph at a, and point B at b. For any given datum plane such as $A'B'$, the true map positions of these points would be at a' and b'. In other words point A, with an elevation above the datum, has been displaced away from the principal point C, a distance aa', and point B, with an elevation below the datum, has been displaced toward the principal point a distance bb'.

Diagrams similar to Fig. 6 make it apparent that relief displacement increases as the angular field increases or as the difference in elevation between the point and the datum plane increases. For terrain features of moderate relief it is difficult to detect this displacement on the photograph by casual inspection. However, the displacement of tall buildings, tanks, etc., is readily seen as in Figs. 6 and 7. It is evident, as shown in Figs. 6 and 7, that relief displacements radiate from the principal point of a truly vertical photograph, thus directions are correct from the principal point but distances are not.

The derivation of the mathematical expression for the relief displacement is very simple. In Fig. 6 let the distance Ca equal r and the displacement aa' equal e. Then:

$$\frac{e}{r} = \frac{h}{H} \text{ and } e = \frac{rh}{H} \quad \ldots\ldots\ldots\ldots\ldots \quad (2)$$

Although relief displacements are annoying when compiling planimetric detail by graphical methods or in la[illegible]



Fairchild Camera and Instrument Corp. Photo

Fig. 4. Fairchild mirror stereoscope with binocular attachment for obtaining a magnified view.

ing mosaics, they form the very basis of a system of measurement used in stereoscopic plotting instruments for the determination of elevations.

Displacements due to tilt

Only truly vertical photographs have been considered previously, but due to practical limitations in flying it is virtually impossible to take a strip of vertical photographs entirely free from tilt, small tilts up to 5 deg. being frequently present. By tilt is meant a deviation of the camera axis from the true vertical. Tilt causes certain image displacements which need consideration. A square area on level ground photographed with the camera axis truly vertical gives an image on the photograph which is also a square as shown by the solid outline in the lower part of Fig. 8. Now suppose the camera axis is tilted a few degrees to see what displacements are introduced. Under these conditions it will be seen that the planes of the vertical and tilted photographs intersect along a common line called the axis of tilt. A line through the principal point, *C*, of the tilted photograph, perpendicular to the axis of tilt, is called the principal line. The point where this line crosses the axis of tilt is called the isocenter *I*.

The isocenter is the point from which tilt displacements radiate, as shown by the diagonal lines extending through the corners of the original square. Thus, in this case, tilt has distorted the square image (solid lines) into a trapezoidal shape (dotted lines). From this diagram it should be evident that on a tilted photograph of flat terrain, true direction rays can be drawn to various points provided the isocenter, *I*, is used as the origin. Another point of interest is the nadir, or plumb point *N*. This point is located on the principal line vertically below the camera lens. The nadir point is the origin from which relief displacements radiate. (It is stated above that relief displacements radiate from the principal point of a truly vertical photograph. This is true since the nadir and principal points coincide in this case.)

Because relief and tilt displacements each radiate from a different point, there is no one point on a tilted photograph of rugged terrain from which direction rays are correct. This factor often causes difficulties in certain graphic compilation methods, such as radial plots. Even in relatively flat terrain tilted photographs are annoying because rather tedious tilt computations are required in order to locate the isocenter with any degree of accuracy.

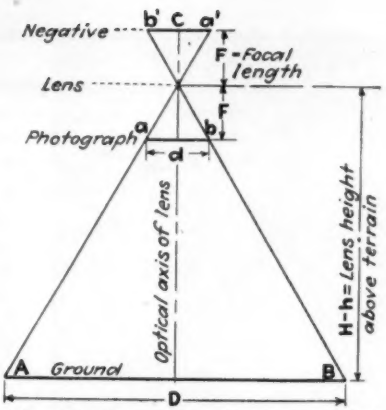


Fig. 5. Scale relationships in a vertical aerial photograph

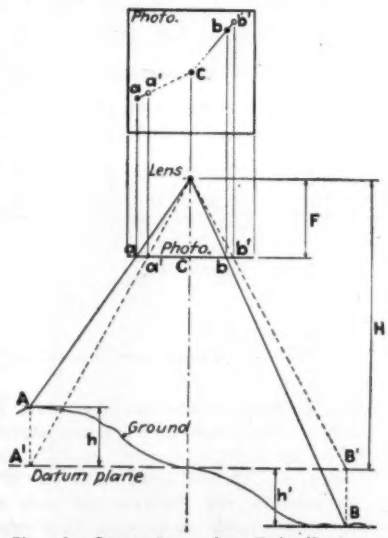


Fig. 6. Geometry of relief displacements. Elevation displaces outward; depression, inward.

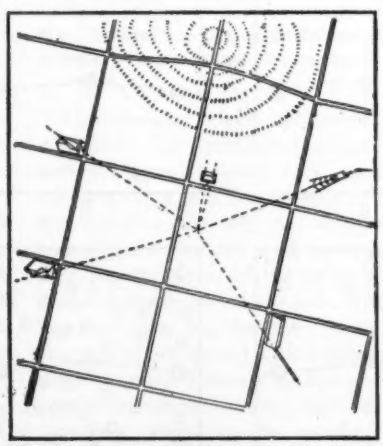


Fig. 7. Due to relief displacement effect on the photograph the hill in the upper part makes a straight road on the ground appear curved. Also note the displacement of top of buildings and tank.

Planimetric mapping

As stated above, relief displacements radiate from the principal point of a truly vertical photograph. Thus, directions are correct from this point, but distances are not. This characteristic of vertical photographs forms the basis of the radial plot method of planimetric mapping. By this method a network of horizontal control points is established graphically. The density of the points must be sufficient for tracing detail directly from the photographs, a small area at a time. The theory of the method is comparable to the intersection and resection of points in plane-table surveying. The various operational steps in the construction of a radial plot from one flight of photographs are as follows:

1. Construct a projection or grid on a transparent material (grained cellulose acetate) at the average scale of the photographs. Plot all horizontal ground control points on this projection.

For only one strip of photographs it is desirable to have three stations in the area of overlap of the first two photographs and one station in every fifth or sixth photograph. Identify and mark these control points on all photographs in which they appear (Fig. 9A).

2. Locate the principal point of each photograph and find its position on adjacent overlapping photographs (Fig. 9B). As the photographs are overlapped 60 percent in line of flight, each photograph in the strip (except the first and last) will contain the positions of three consecutive principal points. Draw azimuth lines connecting successive principal points on each photograph (Fig. 9C).

3. Select supplementary control or pass points near the lateral edges of each photograph. Each of these points should also be in the triple overlap area. Definite points such as road intersections, isolated bushes, etc., should be used. Nine points will now be indicated on each photograph—three principal points and six pass points—plus any ground control

points in the area (Fig. 9D). From the principal point draw short radial lines through all of these points, the appearance of the photograph now being as shown in Fig. 9E.

4. Make a template for each photograph. These templates are a record of the direction rays from the principal point to all of the previously mentioned points. The most common type of template is assembled by placing slotted metal arms over studs pinned to the various points on the photograph. One such template is shown in the lower left corner of Fig. 10.

5. Lay the previously constructed projection on a sheet of rather soft composition board. Place a metal stud directly over each control station and nail or pin it in position (the pin is placed in the hollow shaft of the stud).

6. Take the first template and place its three control arms over the corresponding control studs on the projection sheet, using it like a three-arm protractor. This operation fixes the position of the principal point of the first photograph by the three-point method commonly used in planetable surveying.

7. Take template No. 2 and align its rear azimuth arm to the corresponding one of the previous template. Then slide template No. 2 along the azimuth line until the arms to the ground control points fit on their respective studs. A stud is now inserted where the arms to the pass points intersect.

8. Adjust the remaining templates

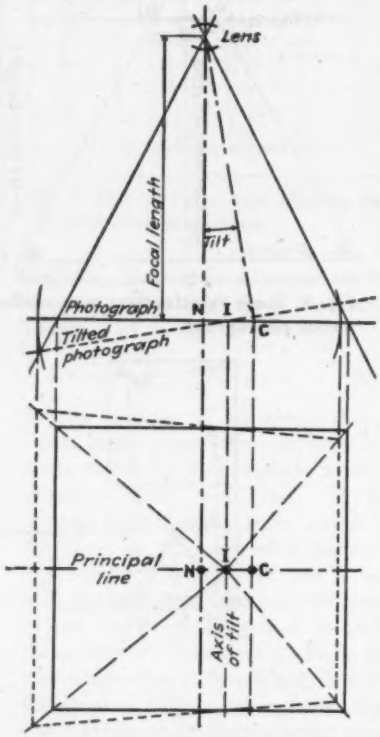


Fig. 8. Diagram showing the effect of tilt on the image of a square object. Principal point is denoted by "C", isocenter by "I", and nadir point by "N". To simplify the diagram the axis of tilt was assumed to be parallel to edge of photograph.

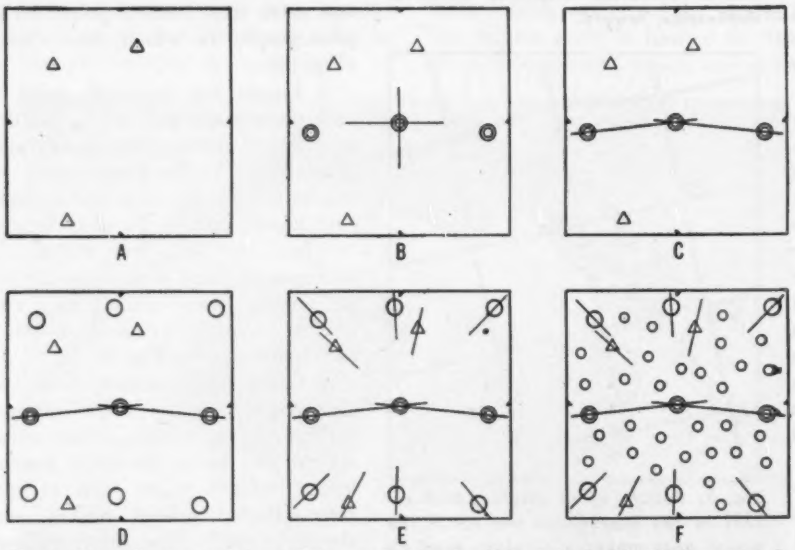


Fig. 9. Steps in preparing a photograph for a radial plot: A, identifying ground control; B, locating principal point and transferring principal point from adjacent photographs; C, drawing azimuth lines; D, selecting pass points; E, Drawing radial lines; F, selecting detail points.

in the same way, except that now no ground control points may be available. Each template is adjusted by sliding it along the azimuth line until the proper pass point arms fall on the studs previously fixed by a two-point intersection, thereby giving a three-point intersection. Where another ground control stud is reached (at the fifth or sixth template, for example) it may be necessary to flex, lengthen, or shorten the entire template assembly like an accordion. Upon completion of this adjustment the true map positions of all of the principal points and pass points are obtained at the scale of the projection sheet. For a large area covered by many strips of photographs less ground control will be required per photograph than when a single strip is used. A part of the template assembly for three strips of photographs is shown in Fig. 10.

9. Prick on the projection sheet the true horizontal position of each principal and pass point by pushing a needle through the hollow stud shaft. The template assembly is now dismantled.

10. Compile the detail. The true map positions of nine points on each photograph (three principal points and six pass points) are now on the projection sheet. For the accurate compilation of planimetric detail the areas between these points must be subdivided into smaller areas, in which discrepancies due to relief, tilt, or scale differences are small, preferably less than 0.05 in. For this purpose a large number of intermediate detail points are located by intersections, the density varying from about a 2-in. separation in flat terrain to perhaps ½-in. in rugged terrain (Fig. 9F). This is done by positioning and orienting each successive photograph under the transparent projection sheet (using the principal points and direction rays to pass points) and drawing on the sheet additional short direction rays through all points desired, thus obtaining a series of three-point intersections. Then, using each photograph under the projection sheet, small areas of detail can be traced by adjusting the detail points on the photograph to fit the corresponding points on the sheet. Often, an optical map projector is used in this operation, thereby facilitating the compilation. The position accuracy of de-

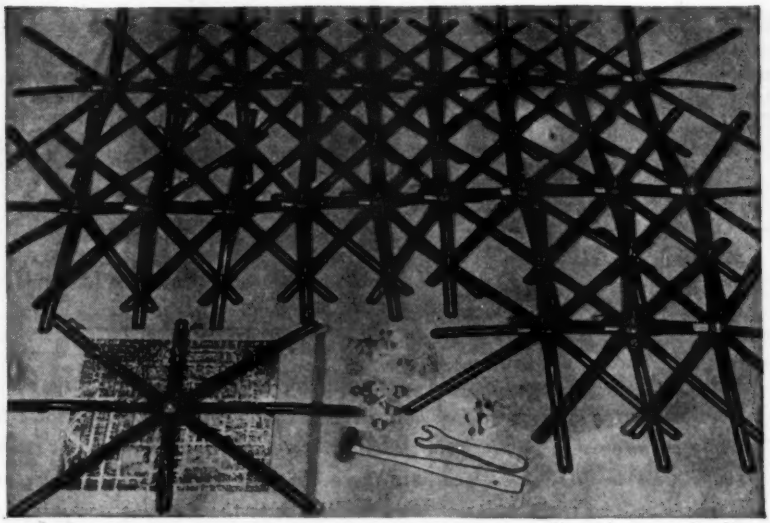
tail in the average radial plot is about 0.02 to 0.04 in.

A mosaic is constructed if a composite photograph representation of a large area is desired, position accuracy of detail being of secondary importance. A mosaic consists of a number of overlapping vertical photographs pasted together so that image details at their junctions match. A mosaic may be considered as a planimetric map substitute whose cost and time of completion are comparatively small. If constructed from a single flight of photographs it is termed a strip mosaic, a type often used in route planning. Mosaics covering considerable areas are used for studies in land utilization.

If ground control points are not used in assembling the mosaic it is called an uncontrolled mosaic, and is usually made with contact prints. If several selected photographic images are fitted to a ground control then the term controlled mosaic is used. Except for flat terrain, each photograph in a mosaic contains relief displacements. For this reason it is obvious that the accuracy of even a controlled mosaic does not approach that of a planimetric map. Depending on ruggedness of the terrain, errors in position from 0.05 to 0.01 in. can be expected. The several steps in the construction of a controlled mosaic follow.

To obtain a network of horizontal control points of sufficient density, a radial plot is run at the average scale of the photographs. Contact prints on low-shrink paper are used for this plot. As stated above, a radial plot furnishes the true horizontal positions of nine points on each photograph. The error in position of these points on the photograph, compared to their radial plot positions, can be measured. These data permit the computation of the approximate tilt and scale errors in each photograph. This information is used in setting a special rectifying camera to produce prints free from tilt and with equal scale. Mosaic prints are usually made on single-weight glossy paper.

The principal points, pass points, and ground control points used in the radial plot are now pricked on the mosaic prints and encircled with washable ink. The radial plot positions of these same points are now transferred to the mosaic mounting board (usually masonite).



Abrams Instrument Co. Photo

Fig. 10. An assembly of metal templates (mechanical triangulators) for a radial plot. Method of assembling individual template is shown at lower left.

Abrams Aerial Survey Corp. Photo

Fig. 11. Constructing an aerial mosaic by mounting the trimmed photographs. The completed mosaic will be reduced photographically to a 20 x 24-in. negative.

The mosaic prints may now be mounted. The undesired edges of each print are cut away in a manner which gives a thin feather-edge. The appropriate part of the mounting board is then coated with paste and the principal point of the print positioned with the aid of a needle. Holding the center on, the outer parts of the print are stretched with a squeegee until the circled points on the photograph are directly over the corresponding points on the mount. In this operation the coincidence of the points is checked by flipping, that is, raising and lowering the print corner with such rapidity that the points on the photograph and mount appear to be superposed due to persistence of vision. The adjacent prints are now mounted one by one, cutting off a part of the overlapping area so that the final mosaic is composed chiefly of the central parts of each print, where the relief displacements are relatively small. Considerable experience is needed to select the cutting line so that no abrupt change in image tone is visible at the junction. The completed mosaic board (Fig. 11) is reduced photographically to a 20 x 24-in. negative, from which any desired number of prints can be made.

[The application of photogrammetry to topographic and military mapping will be discussed in a concluding article by Mr. Ask to appear in the Dec. 14 issue.—THE EDITORS]

An Official Interpretation of

Public Health Service Water Standards

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***Editor's Note**—Revised Federal standards for drinking water quality, which were formulated by an advisory board representing all the national societies having an interest in public water supplies, were adopted by the U. S. Public Health Service in 1942. Since then there has been much concern expressed by municipal and state waterworks authorities as to the meaning and intent of certain statements in the standards, the rigidity of some of its requirements and the possible legal interpretation that may be applied to the detriment of the water purveyor. The viewpoint of the Public Health Service on these questions was stated by Mr. Hoskins in an address before the California Section of the American Water Works Association in Los Angeles on Oct. 25, much of which is reproduced in the following report.*

IN ORDER to safeguard the health of the public, the Public Health Service is required to certify to the safety of drinking water offered by common carrier for the use of passengers carried in interstate traffic. This function has been performed in close cooperation with the state health authorities. The respective states generally report upon the quality of the supplies under their jurisdictions that are furnished to interstate carriers and recommend to the Surgeon General either their acceptance or prohibition for such purposes. Upon such recommendation, the Public Health Service, as the certifying authority, issues a certificate to the carrier approving or prohibiting the use of water from each supply concerned. Accordingly, the federal and state health authorities are jointly responsible for the safety of drinking water on interstate carriers.

This responsibility on the part of the Public Health Service is nationwide and at once implies a specific definition of a safe drinking water that is yet broad enough to be generally applicable. Hence, there was developed in 1914, and revised in 1925 and again in 1942, statement of a standard designed to meet these requirements.

These standards and the revisions were developed and formulated in each instance by an advisory board to the Surgeon General, composed of members representing all the national societies and agencies having specific interest in the matter of safe public water supplies. The extensive deliberations of the board, the period of time required by the board for completing their labors, and the wide opportunities for discussion in the technical press of the matters under consideration all testify to the sincere effort and thought put into the formulation and statement of the finished document, and, by implication at least, the compromises that were necessary to effect agreement on the principles involved.

Interpretation of standards

The committees recognized, and clearly stated in their reports, the inadvisability of a "rigid and automatic application" of the standards and specifically counseled that the certifying authority exercise judgment and discretion in applying the standards. This the Public Health Service has consistently endeavored to do and I believe has done. There is no reason for, or intention of varying from this policy. The states, in their reporting on supplies under their respective jurisdictions, recommending either approval or disapproval to the Public Health Service as the certifying authority, have likewise been reasonable in their interpretation of the standards.

Regardless of this cooperative approach, considerable apprehension has been expressed in some quarters, as to the meaning and intent of certain statements in the latest revision, the rigidity of some of the requirements, and the possible legal interpretation that may be placed upon certain sections to the detriment of the water purveyor, It is of interest, therefore, to discuss these matters frankly and clarify the viewpoint of the Public Health Service concerning them.

The primary objective in revising the 1925 edition of the standards was to clarify and define some of the general requirements which they contained and also to have them conform to current acceptable water supply practice. As in previous issues, the standard is not considered as a strict engineering specification but a practical objective to be attained through sustained and cooperative effort on the part of all agencies concerned in the production and delivery of a safe water supply to the ultimate consumer.

Taking up now some specific sections of the current revision, the water supply system as defined in the text "includes the works and auxiliaries for collection, treatment, and distribution of the water from the source of supply to the free flowing outlet of the ultimate consumer." The water supply system in all its parts is required to be free from sanitary defects and health hazards. The wording is not materially different from that of the previous edition.

The obvious intent is to stimulate the elimination of cross-connections and back-flow, prevent tampering with

service piping, and insure the delivery of a safe product to the consumer, regardless of whether the water purveyor, the health authority, the building or plumbing department, or other governmental unit is the responsible agent for protection of all the facilities needed to deliver water to the consumer's tap. The fear is expressed that the water department or corporation cannot enforce compliance beyond the curb or meter, and cannot inspect service lines on private property, and yet may be held legally responsible for a condition which it is powerless to prevent.

The Public Health Service takes the attitude that the standard does not apply to the water purveyor but to the product, that the consumer should be protected by the agent having jurisdiction along each section of the water system delivering such product and that by cooperative effort of all agents concerned, such protection can be assured. The possibility of the purveyor's being held liable for damages for cross-connections in buildings over which he has no control would appear to be remote. At least, no such case has been brought to our attention although the 1925 standard included service pipes in the description of the water supply system.

It has been stated also that no water supply system is completely free of sanitary defects and health hazards and that, therefore, strictly interpreted, no supply could be certified for approval under the standards. There is certainly merit in this position, yet practical attainment can be approached by cooperation of the waterworks authority, local and state health authorities and other agencies having jurisdiction.

The Public Health Service considers that a reasonable application of this requirement for purposes of certification of water supplies loaded to common carriers would be to require compliance with the conditions of Section 2.2 as applied to collection, treatment, and distribution works from the source to the meter or connection to the customer's premises, combined with sincere and continued effort on the part of muncipal, county, and state authorities having jurisdiction toward the elimination of sanitary defects and health hazards from the water distribution system within the customer's property. Particularly, the reporting agency should assure itself, by careful investigation, that such sanitary defects or health hazards do not exist on any water service line used for delivering drinking water to common carrier conveyances. The investigation of such water service lines should include the entire system served by them, beginning with their first point of connection to the water mains of the public water supply system.

BACKGROUND DATA

Copies of the U.S.P.H.S. Drinking Water Standards may be obtained from the Superintendent of Documents, Washington, D. C.; ask for Reprint No. 2440, which is priced at 10c. the copy. The Standards are also reproduced in the *Journal* of the American Water Works Association, Jan. 1943, p. 93.

Other articles reflecting the attitude of the American Water Works Association are to be found in the *Journal* issues of: Feb. 1944, p. 213 (Resolutions by the board of directors); July 1944, p. 781 (Report of a conference between A.W.W.A. and U.S.P.H.S. representatives); and Nov. 1944, p. 1,267 (State Health Officers Circular Letter No. 85 accompanied by editorial comment).

Collection of samples

The minimum number of samples to be collected from the distribution system for bacteriological examination has been quite widely discussed. It is generally agreed that the location of the sampling points should be selected with care and that preferably they should be continuously changed or rotated to evaluate the average condition of the water throughout the distribution system. The Public Health Service appreciates that during the war emergency full compliance with the sampling schedule of the standard may not be possible. It is believed, however, that sincere effort should be made to build up a sampling program that will within a reasonable period, attain that objective.

As to the number of samples from the distribution system specified per month based on population served, it should be pointed out that the basic assumption is that the water entering the distribution system meets the requirements of the standard and, hence, the sampling is primarily a check on the potential hazards to which the piping system is subjected. Therefore, regardless of the initial high quality of any water supply, distribution system sampling at the specified rate is justified for the protection of the consumer. Where these hazards are known to be excessive, the conscientious authority would doubtless want to increase the frequency of sampling above that specified until such time as the hazards are reduced.

The analytical methods of examination specified are those of the American Public Health Association and American Water Works Association. These procedures have wide acceptance, are periodically reviewed and revised by competent workers in their fields, and are applicable to a wide range of water characteristics. It is entirely probable that some few waters of special types or qualities can be examined more properly by some variation or modification of the standard procedure. Although it is obviously impossible to cover all such variants in a statement of standard applicable to the entire country, nevertheless the certifying authority, in any reasonable application, would use judgment in considering each such special case. It is believed also that such inadequacies of the standard methods procedures should be brought to the attention of those responsible for their revision and promulgation.

The provision of either the 10 ml. or 100 ml. portion of sample needs no particular mention inasmuch as either size is equally acceptable.

Physical and chemical qualities

The physical characteristics of turbidity and color are more clearly defined in the revised standard than they were in the 1925 edition, or really more liberally specified inasmuch as the earlier edition required the water to be clear and colorless, whereas the revision limits the turbidity to 10 ppm. and the color to 20 on the standard cobalt scale. Nevertheless, it is contended by some that these characteristics have no relation to safety and, therefore, should not be a part of the standard. The Public Health Service does not subscribe to this view. Certainly turbidity is frequently an indication of unusual conditions, in adequate treatment or even of direct contamination. Either turbidity or color may render a drinking water so unacceptable that consumers will be driven to less safe sources of supply. In any event, the art of water treatment has so far advanced that high turbidity or color need not be

endured and, it is believed, should not be tolerated.

As to the requirements of the standard concerned with chemical characteristics, some significant changes have been made from the previous edition. Toxic chemicals such as fluorides, arsenic and solenium have been definitely limited in amount and certain other substances producing known harmful physiological effects are not permitted in any amount. Analyses for these chemicals are indicated semi-annually. However, such semi-annual examinations should not be necessary where experience and examination indicate that such substances are not present or likely to be present in the water source under consideration and provided that a statement to that effect is made by the reporting agency. Where such substances may be present in the finished water because of the addition of water treatment chemicals or for other reasons, more frequent chemical analyses should be made from samples collected throughout the system.

It has been stated that the requirement of chemical characteristics in the water delivered, indirectly implies a prohibition of the use of certain materials in distribution pipes. No such purpose or intent can be ascribed to the advisory committee and certainly no such interpretation would be made to the Public Health Service. It is obvious, however, that where harmful ingredients are contributed by the distribution system piping, such contributions should be eliminated by the selection of suitable piping materials.

A reasonable viewpoint

Many of these questions of interpretation and reasonableness in applying the Drinking Water Standards are discussed at some length in Circular Letter No. 85 of the Surgeon General to State Health Officers. (*Editors Note:* See *Journal* of the American Water Works Association, Nov. 1944, p. 1,267). It is hoped that this exposition of viewpoint will resolve any possible misunderstandings that may have existed, or misgivings as to the intent of the advisory committee or the Public Health Service in developing and applying a drinking water standard that will, if observed, provide a safe product for all of us.

There is one point in the practical application of the standards that has been a matter of continuing concern to the certifying authority. I refer to the issuance of provisional certificates for such supplies as have definite and sometimes minor defects, but which can be eliminated if due diligence is exercised by the water purveyor. Too frequently such diligence is not shown and the supply has been carried in the provisional certification category from year to year.

It is unreasonable to expect the certifying authority to accept the responsibility of continuously condoning health hazards in any water supply where no sincere effort is demonstrated on the part of those in responsible charge to effect corrections. This attitude was expressed by the Surgeon in State Health Officers' Circular Letter No. 78 which defines a revised policy and states:

> "It is believed that the continuous use of a 'provisional' certification serves no useful purpose and therefore, beginning with the calendar year 1944, recommendations for 'provisional' certification will be accepted only if a definite time limit is specified for correction of existing major defects. This time limit will not exceed twelve months in the case of water supply sources as well as in watering practices requiring major construction. This time limit will not exceed three months where changes of a minor nature in water practices are required. An extension to these time limits will be granted whenever a shortage of critical material or other major reason requires such extension."

A brief statement regarding the *Manual of Recommended Water Sanitation Practice* may be pertinent, inasmuch as it accompanies the *Drinking Water Standard* as published. This manual is an effort to present what the Public Health Service believes to be a "general description of those features of water supply systems and their operation which may be said to conform to accepted principles of good sanitation." It was designed to be helpful to the reporting agency in reaching a decision as to "whether or not a particular water supply may meet reasonably acceptable sanitary requirements in respect to its sources and protection as presented in Section 2 of the standards."

It is in large part an extension of the appendix of the 1925 edition of the standards together with some recommended procedures and explanatory material that were incorporated in that text. There are given in outline form those features of water supply systems which may be included in the sanitary survey including a list of major health hazards and sanitary defects, recommended sanitary requirements for water treatment and for water distribution systems, and an explanatory discussion of the bacteriological and chemical requirements.

Manual is only a guide

Although it is clearly and repeatedly stated throughout the document that this manual does not constitute a part of the standard and is intended to serve only as a guide to the reporting agency, nevertheless, it has been said that it is so considered by many and that it should be issued altogether separate and apart from the standard itself. There is a serious doubt that the manual would have the value and availability as an explanatory guide that it now possesses if it did not accompany the document which it is intended to interpret.

It has been claimed also that the subject matter of such an explanatory manual would be considered as mandatory and, hence, would crystallize or inhibit progress in the art of water supply. It need only be reiterated that this or any other manual should not be considered a last or final word on accepted water supply practice. Both the manual and the standards should and must be amended as improvements in methods of treatment, analysis, or distribution of water take place. Neither can any single document comprise the divergences of views of an entire profession on all details. However, it is believed possible to present for consideration, the basic elements of practice that have been demonstrated to be sound through the years of experiences and trial accumulated by many workers in the field, so that those of us who need and appreciate such guidance may profit. The manual was prepared with this objective and not with the expectation or desire that it would constitute a fixed, inflexible standard.

In any event, the manual has served as a medium for stimulating the expression of views on the subjects presented. If these views can be correlated and properly weighed by those who revise the manual, it should be possible eventually to develop a document that should be of value to those who must pass judgment upon the safe quality of the water supplied to interstate carriers.

Steel Shop Built of Wood and Concrete

L. Verne Lacy
Architect, Lacy & Atherton, Inc., Wilkes-Barre, Pa.

EXAMPLE of the ability of Amer- building designers and construc- to absorb the impact of swiftly nging conditions in material avail- lity is illustrated by a large struc- erected for an eastern steel pany to provide machine shop ilities for the manufacture of vy armament.

typical design, as previously d by the manufacturing company, ld have utilized structural steel riveted joints, knee-braced roof ses and rigid column anchorage. conform to the requirement that a imum amount of critical materials used, a combination of reinforced crete crane columns and runways used, with wood roof construc- n.

The building, enclosing an area 0x900 ft., provides three aisles for rhead cranes of 50-ton capacity spanning 75 ft. between rails. jacent open crane-runways were talled on each side of the building permit outside storage of heavy terial. Each of these runways also erviced by 50-ton cranes spanning ft. over a storage area 420 ft. long. All structural design data con- med to War Production Board ulations. The structure is designed sustain a wind load of 20 lb. per ft. Soil conditions were uniform oughout, consisting of compact y permitting a unit load of 8,000 per sq. ft. Previous experience of company warranted calculation of ne side thrust at 20 percent of ne capacity. The calculated maxi- m loading on each wheel included impact coefficient of 25 percent. e columns are proportioned so that isting moment is 25 percent greater n overturning moment due to nsverse loading. The vertical reac- n from the weight of the crane was computed in calculating the re- ting moment.

The structure is built of concrete m footings to crane rail level. The ne rail supports also carry columns for the roof trusses. Interior columns are wood and those at the exterior supports are reinforced concrete. Outside the building, buttressed type concrete columns, 80 ft. distant, carry a support for a crane spanning outdoor storage.

Level roof over bowstring trusses

The bowstring trusses were fabricated at the site and erected by crane. As it was desirable to avoid valleys, the vertical members of the center trusses and one-half of the outside trusses were extended to support purlin plates formed to a continuous curve between eaves, Fig. 2. Sheet metal gutters and leaders were eliminated. To provide for water from roof drainage falling to grade, concrete paved gutters were installed with outlets at suitable intervals connected to storm sewers. The side and end wall panels were filled solidly

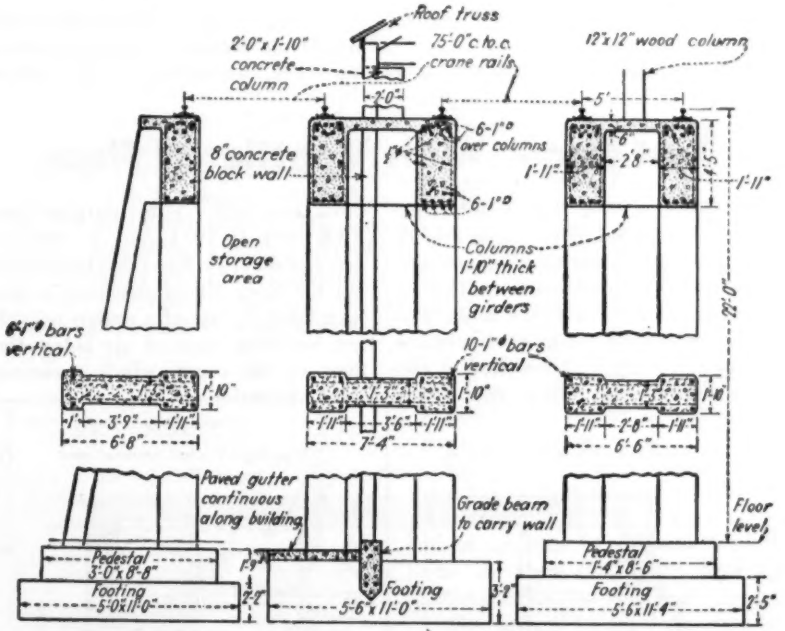


Fig. 1. Concrete framing supports rails for 50 ton cranes and carries a timber bowstring roof truss. Outside storage along the building is serviced by an overhead crane carried on the outside of the building's exterior columns and on buttressed columns 80 ft. distant.

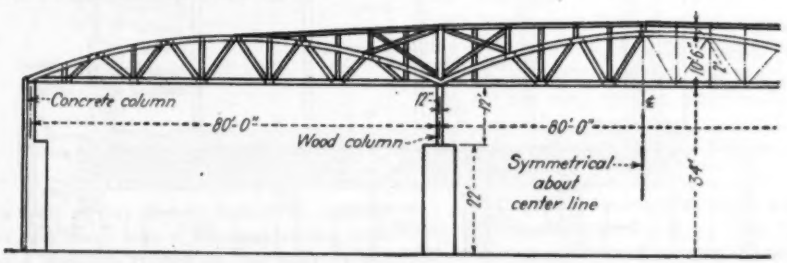


Fig. 2. Roof drainage was simplified by extending the members of the bowstring truss to support a nearly level roof over the 240 ft. width of the building.

Fig. 3. Timber bowstring trusses with "leveling" extensions were preassembled on the site and set in one piece.

with concrete masonry units as no fenestration was desired.

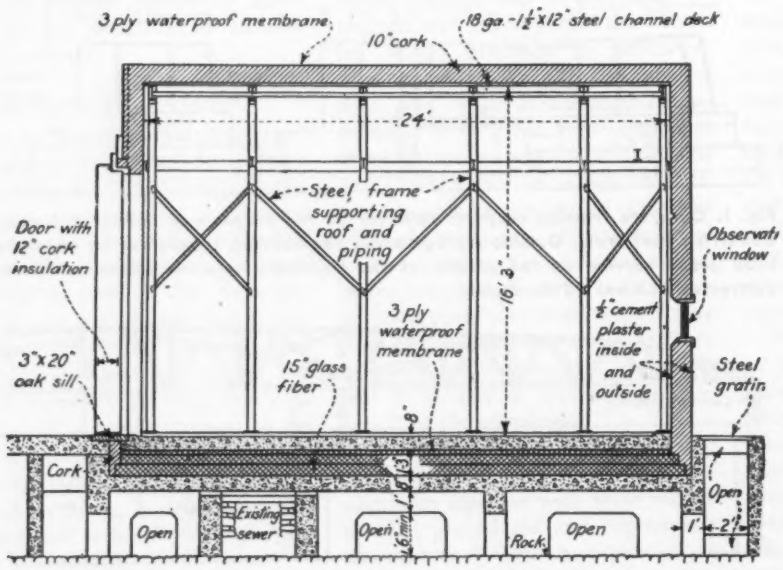
The multiple bay construction progressed from the north to the south end of the building. The superstructure work, concrete floor and machine foundation installation follo closely behind the installation o concrete frame.

No reinforcing was used in footings except that required to vide dwelling for the concrete umns. Rapid installation of columns and crane girders was complished by enclosing the rein ing in the forms on the ground erecting the entire assembly in p with a crane. The concrete was veyed from a nearby plant by t mixers and placed in the forms crane and bottom-dump buckets. proximately 10,000 cu. yd. of crete were required for the struc 10,000 cu. yd. for machine fou tions, and 5,000 cu. yd. for the fl

The structure was designed by & Atherton, architects and engine Wilkes-Barre, Pa. Sordoni Const tion Co., Forty Fort, Wilkes-Ba Pa., erected the building; Roof St tures, Inc., New York City, were subcontractors for the bowstring trusses.

Test Room With Ventilated Floor

Included among the special structures constructed at the Rock Island, Ill., Arsenal is a test building containing a room permitting observation on the operation of military tanks and other equipment within a temperature range of 70 deg. F. below zero to 100 deg. above zero. Other test rooms have been built for this purpose (see *ENR* Sept. 9, 1941, Vol. p. 400 for description of Ft. Knox test building), but the Rock Island structure is distinguished by use of a design providing for circulation of air below the floor of the room. which measures 14x24 ft. inside.



Free circulation of air is provided both longitudinally and transversely below the floor slab of a test room at the Rock Island Arsenal.

Foundation conditions would permitted construction of the slab directly on a shale formation the surface. However, although slab was to be insulated, support the floor in this manner was seen possible cause of heaving and di tegration of the rock, due to the perature variation that might o below the floor as a result of the temperature range in test conditi and the duration of some tests. possibility, plus the fact that rel tion of a large sewer would have b necessary if the slab was placed rectly on the shale, resulted in the of the design illustrated by the companying drawing. As this ill tration shows, air is permitted circulate freely below the slab.

Following a year of severe te including long periods of minus deg. F. temperatures, followed rapid increase in temperature to p 70 deg. F., with the floor load in cess of 2,000 lb. per sq. ft. no evide of cracking of the floor or frost acti in the foundation has been noted.

The work was done by the Ro Island district, U. S. Army Engine Lt. Col. John H. Peil district engine Maj. Frank W. Ashton, head of t general engineering division, a Arnold W. Philipp, head of the desi section.

Raw Water Storage for Des Moines

***Contents in Brief**—Construction of a raw-water reservoir, a pipeline and pumping station will permit storage of water from the Raccoon River until flow on this stream is too small to meet supply needs of Des Moines, at which time the storage will be returned through the same pipeline to augment the river flow. An earthfill dam is being built by general contract to create the reservoir. The pumping station and pipeline are complete, the latter being built of cast iron pipe by the city's maintenance and construction forces.*

CONSTRUCTION of reservoir storage and pumping facilities now under-way at Des Moines will guarantee sufficient water for Iowa's capital city throughout the year, even if a severe drought should seriously curtail flow in the Raccoon River from which the supply is obtained. When the work is completed the available facilities are expected to be of sufficient capacity to meet for some years increased demands resulting from growth of the city.

Des Moines now has a population of 175,000 with a peak 24-hr. water demand of 24 to 25 mgd. The municipality obtains its supply in the southeastern part of the city from 5,000 ft. of underground infiltration gallery penetrating an extensive deposit of coarse sand and gravel in the Raccoon River valley, the water being drawn to a central treatment plant (*ENR* Sept. 11, 1930, p. 398). The gallery, part of which is of 4-ft. diameter and the remainder 5 ft., roughly parallels the river at a distance of from 150 to 300 ft. to one side and with its roof about 15 ft. below the bottom of the streambed. The Raccoon River valley—about two miles wide—extends many miles west of the city and the stream slowly winds its way over the surface of the gravel formation. This condition results in a high saturation of the sands and gravels penetrated by the infiltration collecting system when the streambed is comparatively free of silt.

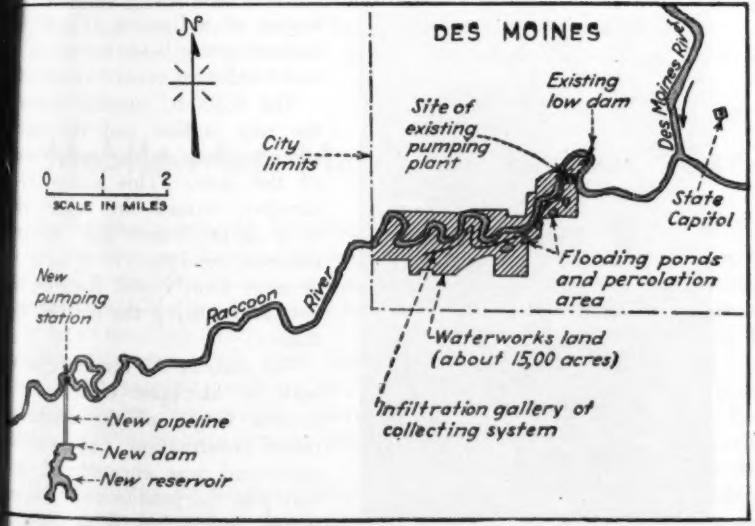


Fig. 1. Water supply facilities now being built at Des Moines include an earthfill dam to create the reservoir indicated at the lower left, a pipeline leading from the reservoir to the Raccoon River, and a pumping station on the bank of this stream. Water will be pumped to the reservoir during highwater periods and released at times of low flow in the Raccoon.

A low ogee-type dam a short distance downstream from the central station provides a few feet of water over the sand formation at all times, thus maintaining a higher groundwater plane over and around the collecting gallery. But during periods of drought, it is necessary to pump water into several ponds or flooding basins at higher elevation on nearby land, this water reaching the gallery by percolation. Under dry-weather conditions the discharge over the dam is extremely small. The possibility of still longer periods of drought than those of the past, coupled with the limited storage above the dam and the dangers of a reduced water table, dictated that measures be taken to safeguard the city against a possible water shortage.

The plan being followed calls for the construction of a 4,800-acre ft. storage reservoir, a 3,300-ft. pipeline, and a small pumping station at a point about 15 river miles upstream from the collecting gallery (Fig. 1). The new facilities will draw water from the Raccoon River for storage during periods of moderate flow, returning as needed the stored supply to the stream through the same pipeline.

This storage reservoir has the sole purpose to provide water to make up the deficiency in flow of the Raccoon River in time of drought. In the past 27 years there have been two short periods, namely, in August and September, 1934, and in January, 1940, when the flow of the Raccoon River was less than the water delivered by the waterworks pumps. The capacity of the reservoir has been made such that it could supply any deficiency in flow of record up to this time, even though the pumpage of the city should be doubled It is expected that water stored in this reservoir will be needed only on rare occasions.

The reservoir is being constructed on a hilly watershed 1.4 sq. mi. in area adjoining the Raccoon River. Although a small amount of runoff from the watershed will occur, the

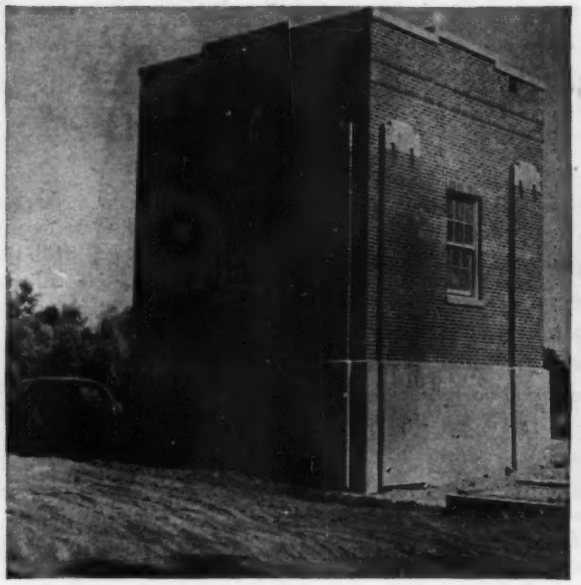


Fig. 2. New pumping station at river's edge houses two 10-mgd. electrically driven centrifugal pumps. Right: L portion of pumphouse, consisting of the reinforced concrete cylinder in the background, and the intake at the left, built on a site kept dry by wellpoints.

principal storage will be obtained by pumping from the river against a static head of 102 ft. It was deemed expedient to utilize storage in a side ravine rather than to build a dam in the main channel of the river. The adopted plan was most satisfactory because of the minimum area of expensive land flooded, the possibility of a deep-water pond, and the freedom from silting and the consequently longer life for a reservoir on a small watershed as compared to an expensive dam on the Raccoon River, where excessive sedimentation would make the reservoir of short life and the problems from floods of large magnitude would need to be solved.

Reservoir provides 100-day supply

An earthen dam is being constructed to create the reservoir, which will provide sufficient additional capacity to permit the city to meet for 100 days maximum water demands under the most severe drought conditions. The drainage area above the dam is sufficiently limited to require only small spillway capacity.

The dam will have a maximum height of 85 ft. and a crest length of 1,730 ft.; a 30-ft. top width will permit a 24-ft. wide road to be routed over the structure. Clay for the impervious central core of the fill is delivered by carrying-scrapers from two borrow pits a short distance upstream in the reservoir area, while pervious material is supplied from two fine sand areas near the dam and by truck from a borrow area near the site of the pumping station. Both types of material are spread with patrol graders and compacted in 6-in. layers with sheepsfoot rollers.

Fig. 3. Shaft extending upward from gate chamber in outlet tunnel was built with concrete mixed by a paver; operating house remains to be added on top of shaft.

Two 10-mgd. electrically dr centrifugal pumps are being inst to provide sufficient capacity in new pumping station; no stan unit driven by a different po source is considered necessary, view of the many days during year when pumping conditions expected to be satisfactory. foundation for the station was b as a reinforced-concrete cylinder, working site being kept dry by system of wellpoints (Fig. 2). superstructure is square and of b and reinforced concrete construct

The 3,300-ft. pipeline connec the new station and the reser extends through the west abutm of the dam. This section of pipeline, termed the tunnel out is a 48-in. inside dia. reinforc concrete conduit. It is being u to carry away runoff from the re voir area during the earthfill ope tions.

The ends of the tunnel outlet w built in an open trench, but greater length of the conduit w tunnel construction. Although se quicksand was encountered, yel clay was the predominant soil pe trated, and a 3-in. thick cap-and- type of timber shoring was employ

To fill the voids around the co pleted conduit, a silt grout conta ing 10 percent of cement was ad through a group of four 1¼-in. d

Fig. 4. Fill for the dam is being delivered by carrying scrapers and trucks, the latter being used for the longer hauls. Spread by patrol graders, the material is compacted in 6-in. layers with sheepsfoot rollers. Gate shaft is shown at left.

holes in each 32-ft. length of conduit, the holes of each group being spaced 90 deg. apart; 17 groups of openings in all being used. Grouting operations continued at each hole until a pressure of 30 psi. could be maintained for 30 min. Observations to date indicate that this work has provided an excellent seal around the conduit for its full length.

From the tunnel outlet to the river a 24-in. cast iron line is used. This part of the pipeline was built by the municipality with its own forces, which is in keeping with the practice at Des Moines where maintenance and operating crews of the water department build all new water mains.

On the work described, the city is represented by Dale L. Maffitt, general manager of the municipal waterworks. Kramme-Jensen Construction Co., Des Moines, constructed the pumping station and intake.

The general contract for the outlet tunnel and the dam, which is to be completed this year, is held by Arthur H. Neumann and Bros. Co., Des Moines, which sublet the earthwork to Peter Kiewit & Sons Co., Omaha, Nebraska.

Alvord, Burdick & Howson, consulting engineers of Chicago, represented on the job by Resident Engineer V. P. Kneer, are general consultants for the $600,000 project. L. T. Harza, Chicago, is consultant on the dam.

Mobile Map Making Units for War

During the month of December, 1943, an Engineer topographic unit attached to the 36th Division in Italy produced 47,224 front-line maps for the use of the Fifth Army.

The equipment which made such on-the-spot mapping possible is, in effect, a complete photographic laboratory and lithographing printing plant on wheels.

In June, 1940, the Engineer Board was assigned the task of developing, service testing, and later, procuring and assembling mobile map reproduction sections to equip Engineer topographic organizations for their assigned functions of map making in the field. Because of the speed with which the initial topographic units were moving overseas, it was necessary that procurement and assembly be carried on concurrently with design and development.

There are 11 basic types of the mobile map reproduction sections. Covering the field of map reproduction requirements of American forces, they are designated briefly as: 20 by 22½-in. and 22 by 29-in. press sections; 24 by 24-in. and 24 by 30-in. camera sections; laboratory, map layout, and photographic sections; plate grainer section; plate process section; combination "A," and combination "B."

Various combinations of the above sections, depending upon the functions of the organization involved, are assembled into map reproduction trains. The largest and most representative train is that comprising ten of these sections for a topographic Army Battalion. Maximum production capacity of this train with its four lithographic presses runs up to 20,000 maps an hour.

Procurement of the sections is now carried out through normal Engineer channels, but the Engineer Board has continued to improve the design and efficiency of the equipment. Where the first sections were all trailer-mounted, for instance, late models are truck-mounted to increase mobility and tactical value of the units.

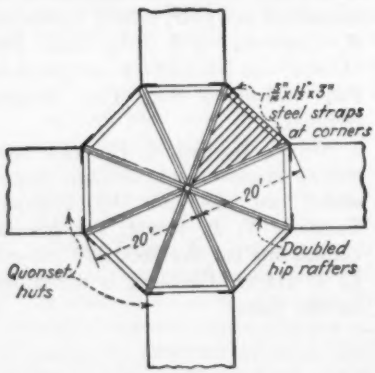
ENGINEERING ABROAD AS SEEN BY ENR EDITORS

Field and Office Items from the Pacific

N. A. Bowers
Pacific Coast Editor, Engineering News-Record

Octagonal-Shaped Structure Connects Four Quonset Huts

An ingenious design that provided a central room opening into four wings consisting of Quonset huts, used as wards, was developed by the Seabees at a base hospital. By so locating the four Quonset huts that one end of each was in one side of a 40-ft. octagon, as shown in the sketch, four of the eight sides of the central room



Roof plan of structure connecting four Quonset huts.

were formed by the four hut ends. Four intervening walls make a complete wall framing for the commodious central space.

The roof framing was simplified by designing it as an octagonal pyramid made up of eight flat triangular sections. The plate on which these sections rested was strengthened against outward horizontal thrust by the use of steel straps at the eight corners. These straps consisted of $\frac{5}{16}$-in. metal 1½ in. wide and 3 ft. long. The 18-in. length along each of the abutting timber plates gave sufficient area for an adequate lag-screw fastening.

The octagonal roof was made somewhat higher than roofs of the adjoining huts and the wall space in between was covered with screen. This increased the effectiveness of the screen vent at the top of the pyramid roof and provided ventilation which is highly desirable for tropical climates. A concrete floor was used, and in between the Quonset huts the floor edge was turned upward to form a curb for a wall foundation.

Pontoon Cell Sprinkler Tank

A Navy pontoon cell is frequently made into a sprinkler by mounting the cell on a truck and providing it with an outlet terminating in some sort of device for spreading the discharged water. A very simple form of spreader is a steel plate fastened just

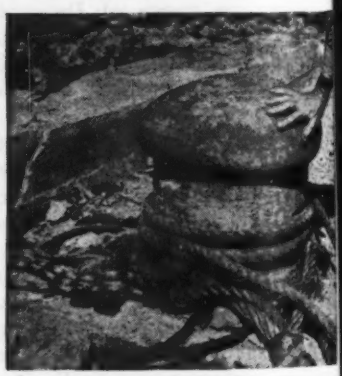
Rear view of a pump attachment to a water truck for convenience in taking on or discharging water.

below the open end of a vertical discharge pipe. By spot welding the plate to the pipe (four spot welds ordinarily are used), so that the plate is supported about ¼ in. from the end of the pipe, the desired spray distribution is obtained.

A more elaborate arrangement of pontoon cell sprinkler is shown in the accompanying picture. In this case the sprinkler proper is made from pieces of 2- and 3-in. pipe connected to the bottom of the pontoon and operated by gravity flow. An attached centrifugal pump with a system of four valves makes it possible to pump water out of as well as into the pontoon, thus making the outfit available for fire protection, for supplying water to concrete mixers and for other construction operations that can be served by a 1,300-gal. supply tank.

Japanese Used Concrete For Cast-in-Place Bollards

On waterfront structures erected in the Gilbert and Marshall Islands by the Japanese, built-in bollards made of concrete were frequently found. These bollards, which were cast monolithic with the pier structure, have the advantage that they do not require



Concrete bollard remains intact on wrecked Jap pier.

the use of a critical material and they give an even more rigid connection with the supporting structure than would be obtained by bolting down the conventional iron bollard.

Apparently, the construction method the Nips used was to anchor the reinforcing bars firmly in the deck structure, with the desired projection above the deck surface. When the deck was poured the bollard was cast monolithic in a form that permitted a sort of concrete riser to be carried up around the central reinforcing cage.

Pier Built with Oil Barrels

The substructure of a pier for small boats was quickly and easily made by the Seabees in the Marshall Islands by placing empty oil barrels at low tide in the desired locations and filling them with concrete. In each barrel was a steel angle projecting above the top of the concrete—to serve as anchor and support to which one of the 8x8-in. plumb posts of the pier bent could be bolted. The bents were capped with 6x6-in. timbers. On the sides of the pier 2x10s were bolted on at about 3-ft. centers to prevent small boats from nosing under beneath the deck. The tidal range where this pier was built is about 6 ft. The pier is 12 ft. wide, extends about 50 ft. beyond the end of the approach fill, and has a deck surfacing of pierced steel or Marston plank.

Jib Crane Assembly Handles 2½-ton Pontoon Cells

A 2½-ton jib crane of a design convenient for lifting and turning pontoon cells in assembly depots has been extensively used by Seabees in the Pacific. The crane consists of two parts, a vertical post and a horizontal arm in the form of a simple truss. The post extends from floor to roof truss and has connections at both ends designed for rotation. The horizontal arm consists of an I-beam with a stiffening framework of pipe to increase capacity.

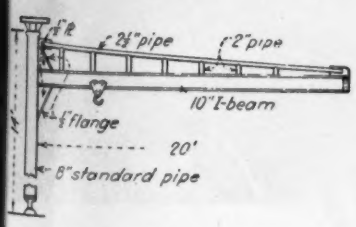


Fig. 1. Detail of 2½-ton jib crane assembly for handling pontoon cells.

Lifting is done with a motor-driven hoist operating on a carriage using the bottom flange of the steel I-beam as a track. A short piece of angle iron bolted to the outer end of the I-beam prevents the carriage from being accidentally run off the end of the beam.

Fig. 2. Jib cranes installed in a pontoon assembly depot.

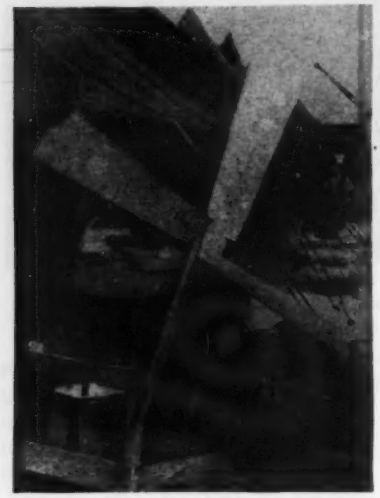
SIX BULLDOZERS COMBINE TO MOVE MAHOGANY LOG

In New Guinea and the Solomon Islands where there is dense growth of hard woods it is often difficult to get forest wreckage out of the way before actual construction of airstrips and other facilities can begin. When a heavy mahogany log lies on soft, wet ground it is not easy to move it quickly, and as many as half a dozen tractors may be needed. The tree shown in the accompanying picture, which was felled by a dynamite charge at the base, had a base diameter of 8 ft. The length of the trunk, up to the point where the top was broken off by shell fire, is 175 ft.

This picture was supplied by Comdr. Roy M. Harris, Seattle, officer in charge of a naval construction regiment.

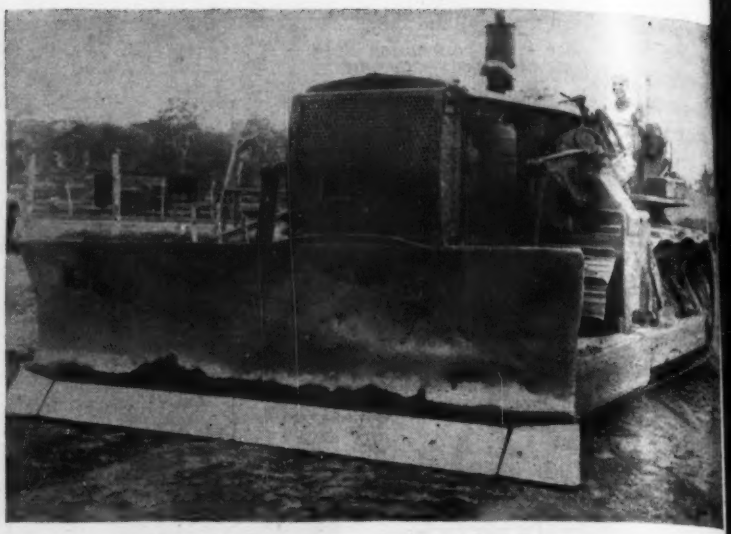
The Windmills of Kwajalein

Throughout the Gilbert and Marshall Islands winds usually blow steadily from one direction over long periods and hence our forces used hundreds of small makeshift windmills for washing clothes prior to the setting up of laundries. Despite the great number, there was no standard design. Each unit was built according to the designer's idea and suited to the available materials. However, all had in common the principle of a horizontal shaft driving a crank to which was attached a vertical plunger agitating the clothing to be washed in a can or wooden tub.



This "two-shirts-size" washing machine has a plunger operating in a 5-gal. can.

The 5-gal. can in the rig shown in the accompanying picture was rated as a "two-shirts" size.



NO REPAIRS IN 1,000 HR. of operation is the record of this bulldozer working close to the front lines in the Solomon Islands. Just how close, at times, is indicated by the marks in the 'dozer blade made by bomb fragments. It was as a result of such front line action by bulldozers that armored cabs were later installed. The operator here shown is S. J. Chellino, Joliet, Ill., Seaman First Class, in a U. S. naval construction battalion.

Clearing Jungle Wreckage Before Construction Starts

In New Guinea and the Solomon Islands where forest cover is extremely heavy Seabees often faced a difficult job in clearing the area prior to the start of actual construction.

The accompanying pictures illustrate the nature of debris removal work required after tropical forests have been "reduced" by bombs and shell fire. Many of the trees are uprooted while others are broken off and the upper portions lie in the wreckage. Trees that remain standing are often shattered and usually are entirely stripped of foliage.

The prescription commonly followed by the Seabees in such cases is plenty of dynamite to break up the large logs and rock fragments. If need for speed is a dominating influence, the fragments are then shoved aside by bulldozers only far enough to clear the area actually needed for the project.

Clearing away uprooted mahogany trees of this size presents a construction problem in itself. Right: After bombardment forested areas may look like this. Note absence of foliage on trees left standing.

It takes a TOUGH Air Compressor for jobs like this!

In tough construction jobs, where compressed air is needed and the going is rough, use a Schramm Air Compressor.

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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

POWER PLANT UNIT
DESCHUTES PROJECT, ORE.

OWNER: Bureau of Reclamation, Bend, Ore. S. O. Harper, chief engineer.

PROJECT: Construction of Unit 3, Cove Power Plant, north of Bend, Ore. New building, 29-ft. 7-in. by 50-ft., to be reinforced concrete, except for wood roof covered with 5-ply built-up roofing and supported by steel roof beams. Penstock, to be of reinforced concrete, is provided with trashrack and radial gate at intake, and terminates in spiral-type turbine scroll case formed in second-stage concrete of the powerhouse. Contract also includes removal of portion of existing concrete forebay to permit installation on new concrete penstock, siphon wasteway and side-channel wasteway; improving crest of existing overflow spillway at upper end of forebay; temporary cofferdam across existing forebay; relocating and reconstructing flume and ditch above power plant; constructing access road and reinforcing bridge; construction of Cove switchyard; and transportation of materials furnished by Government.

CONDITIONS: Contractor to furnish exhaust fan, fixed louver, adjustable dampers, embedded and exposed conduits for switchyard and powerhouse, and grounding system. A other materials forming permanent part of structure to b furnished by Government. Relocation of telephone or powe lines to be performed by Pacific Power & Light Co. Railroa transportation available to Culver, and highway to site work. Contract time is 300 calendar days. Wage rates are skilled labor, $1.25 to $2.00 per hour; semi-skilled, 95c, $1.25; and common, 95c. Existing power units must continu ouput except at times expressly stipulated in specification

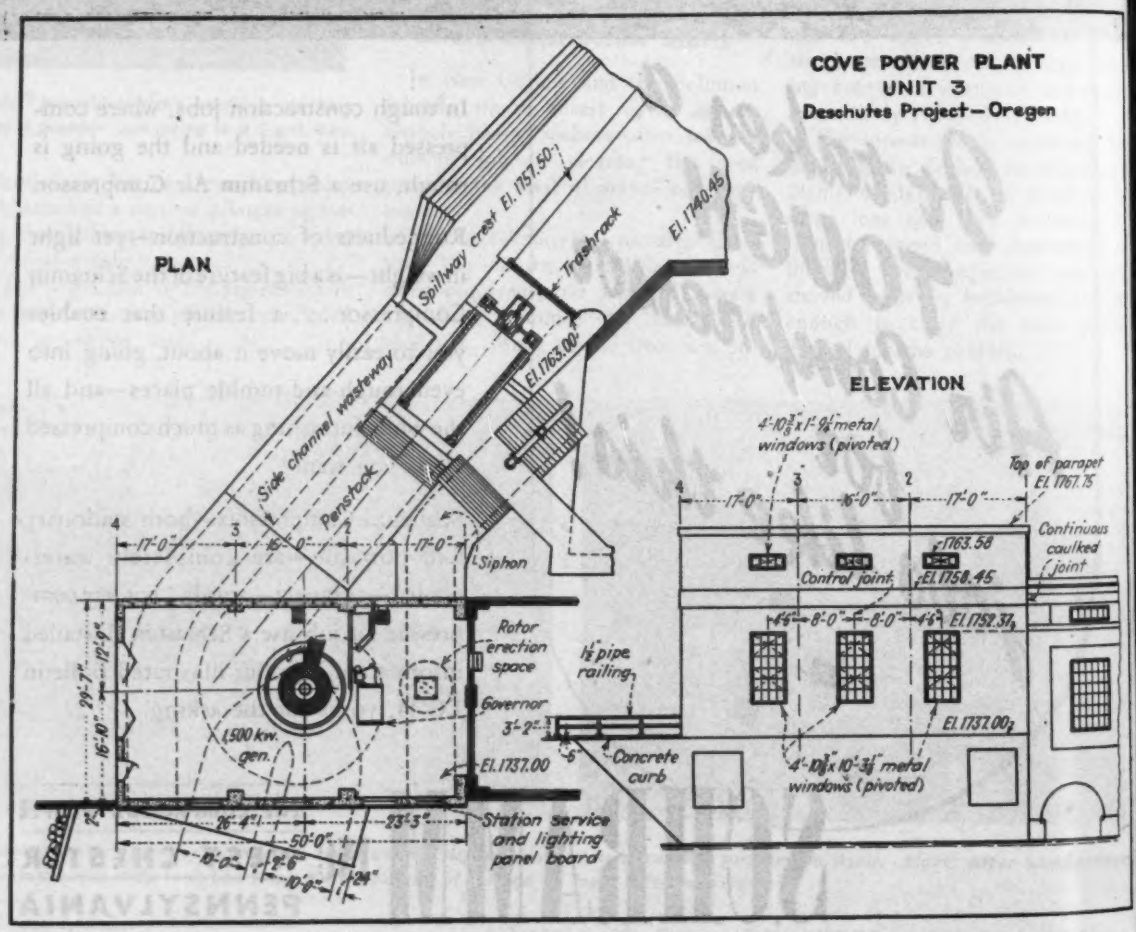
BIDS: Five bids were received September 6, 1944 rangin from the low of $122,968 to $244,303.

LIST OF BIDDERS:

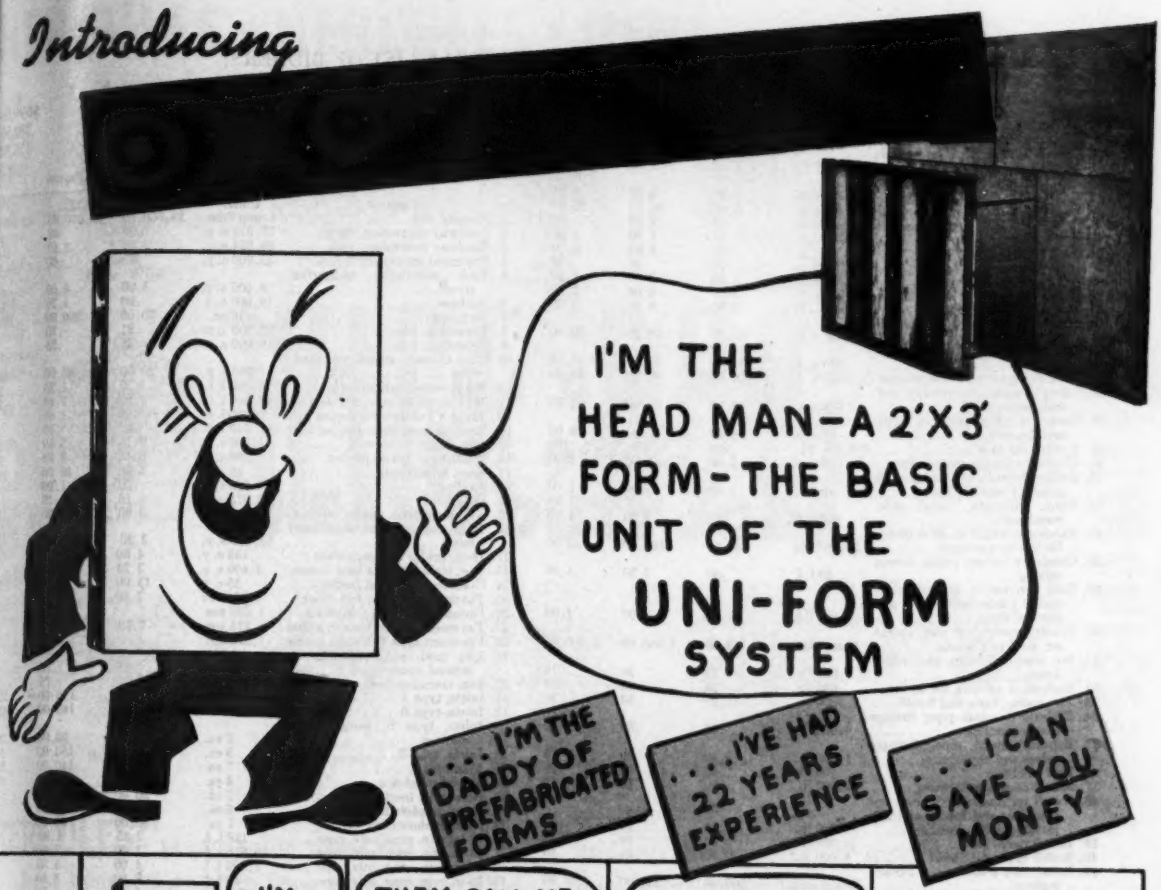
1. C. J. Montag & Sons, Portland, Ore. (low bidder) .. $122,96
2. Scheumann & Johnson, Seattle, Wash. 183,81
3. Morrison-Knudsen Co., Boise, Idaho 184,81
4. Vernon Brothers Co., Boise, Idaho 193,77
5. C. F. Davidson Co., Tacoma, Wash 244,30

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Cofferdam forebay and unwater foundn.	Lump Sum	$5,000.00	$3,000.00	$1,000.00
2. Relocate and maintain exist. flume and ditch	Lump Sum	600.00	1,000.00	750.00
3. Reinforce bridge across power canal	Lump Sum	200.00	300.00	500.00

(*Contract Unit Prices Continued on page* 100)



Introducing


I'M THE HEAD MAN—A 2'X3' FORM—THE BASIC UNIT OF THE UNI-FORM SYSTEM
. . . . I'M THE DADDY OF PREFABRICATED FORMS
. . . . I'VE HAD 22 YEARS EXPERIENCE
. . . I CAN SAVE YOU MONEY
. . . SO MEET MY FAMILY HELPERS . . .
I'M THE 1'X3' FORM
THEY CALL ME SQUARE . . . I'M THE 2'X2' FORM
I'M THE BABY OF THE FAMILY . . . THE 1'X2' FORM
I'M VERSATILE . . . THE ADJUSTABLE FORM

WATCH FOR THE INTERESTING ADVENTURES OF THE UNI-FORM FAMILY IN FUTURE ISSUES

Universal
FORM CLAMP CO.

(Contract Unit Prices Continued from page 98)

4. Excav., all classes, for powerhouse, penstock and wasteways	4,700 c. y.	4.00	8.00	5.00
5. Drilling line holes for rock excav.	500 l. f.	.50	2.00	3.00
6. Excavation, all classes, for road	1,900 c. y.	2.00	2.00	2.50
7. Road and turning area surfacing	100 c. y.	5.00	3.00	1.75
8. Stone barrier at edge of road and turning area	100 l. f.	3.00	2.00	3.00
9. Excavation, all classes, for cove switchyd	180 c. y.	6.00	5.00	5.00
10. Excavation of concrete	100 c. y.	6.00	30.00	12.00
11. Backfill	900 c. y.	.75	2.00	.75
12. Compacting backfill	200 c. y.	.75	2.00	2.50
13. Place tamped gravel fills	30 c. y.	7.00	5.00	5.00
14. Overhaul	3,000 c. y.	.10	.10	.10
15. Rock fills	400 c. y.	1.00	4.00	1.50
16. Dumped riprap	250 c. y.	2.00	4.00	2.50
17. Dry-rock paving	400 s. y.	5.00	5.00	7.00
18. Conc. in powerhouse substructure	540 c. y.	25.00	50.00	50.00
19. Conc. in powerhouse superstructure	200 c. y.	31.00	45.00	85.00
20. Second-stage conc. in powerhouse	330 c. y.	25.00	50.00	50.00
21. Conc. in penstock, spillway and wasteways	600 c. y.	35.00	50.00	65.00
22. Conc. in structures for cove switchyard	35 c. y.	35.00	40.00	70.00
23. Reinforcing bars	210,000 lb.	.065	.07	.105
24. Chip and roughen conc. surface	25 s. y.	2.00	5.00	2.00
25. Drilling holes for anchor bars and grouting bars in place	50 l. f.	1.00	3.00	1.00
26. Furn., fabricate, install galv. metal seals	800 l. f.	.75	2.00	1.25
27. Fabricate, install metal deflector for siphon wasteway	Lump Sum	50.00	100.00	35.00
28. Construct control joints, except calking	60 l. f.	.50	2.00	1.20
29. Calk grooves in control joints and of joints between old and new buildings	120 l. f.	.50	3.00	1.00
30. Constr. powerhouse roof, except str. steel roof beams	Lump Sum	1,500.00	1,500.00	2,000.00
31. Str. steel roof beams and trolley beams	4,000 lb.	.75	.30	.10
32. Embedded anchors for turbine	900 lb.	.25	.25	.30
33. Pier nosing, furn. and install	350 lb.	.25	.50	.30
34. Embedded metal pipe, fittings and accessories	4,000 lb.	.50	.50	.20
35. Exposed metal pipe, fittings, valves and accessories	1,800 lb.	1.00	.60	.15
36. Pipe handrails	500 lb.	.50	.40	.50
37. Miscellaneous metalwork	2,000 lb.	.30	.50	.50
38. Install trashracks, scroll-case access door and frame, and adjustable siphon breaker	12,000 lb.	.10	.10	.15
39. Install radial gate	12,000 lb.	.06	.10	.15
40. Install radial gate hoist	4,000 lb.	.10	.10	.10
41. Install two 6-ton hoists, I-beam trolleys	Lump Sum	200.00	250.00	200.00
42. Install turbine parts embedded in cone	Lump Sum	3,600.00	3,000.00	1,500.00
43. Inst. generator and governor anchor bolts	400 lb.	.10	.50	.30
44. Exhaust fan, louver and dampers	Lump Sum	1,000.00	400.00	500.00
45. Doors and windows, complete, with all hardware	Lump Sum	700.00	600.00	750.00
46. Embedded electr. metal conduit, 1-in. or less in dia	1,100 l. f.	.25	.50	.60
47. As above, 1 to 3-in. in diameter	750 l. f.	.75	1.00	1.50
48. Embedded electr. non-metallic conduit in powerhouse and switchyard	1,250 l. f.	.50	1.00	1.00
49. Exposed electr. metal conduit, 1-in. or less, in power plant, co	750 l. f.	.25	.70	.60
50. Exposed electr. metal conduit, 1 to 3-in. diameter	700 l. f.	.75	1.00	1.50
51. Exposed electr. non-metallic conduit	450 l. f.	.50	1.00	1.00
52. Furn. and install grounding system	200 lb.	.50	1.50	2.75
53. Transport freight furn. by Gov't. from Culver, Ore. to Cove power plant	600 ton	5.00	5.00	2.50
54. As above, from Terrebonne, Ore. to Oromite Substation	15 ton	6.00	5.00	3.00
55. As above, from Redmond, Ore. to Redmond Substation	55 ton	4.00	3.00	1.50

HIGHWAYS, NEW JERSEY

OWNER: New Jersey State Highway Dept., Trenton.

PROJECT: Construction of Route 24, Section 22 and Route 24-N, Section 1, from Fifth Street to the Phillipsburg Toll Bridge Plaza, Warren County, N. J. Involves 10-in. reinforced concrete paving 1.593 miles of roadway; construction of reinforced concrete underpass at the West Bound Ramp; and a reinforced concrete bridge at the Ingersoll-Rand Co.

CONDITIONS: Contractor to furnish all materials and complete work in 140 working days. Rail and highway transportation facilities available. Wage rate minimums are: skilled labor, $1.20; semi-skilled, 65c.; and common, 50c.

BIDS: Eleven bids were received September 18, 1944, ranging from the contract low of $699,048 to $939,582.

PARTIAL LIST OF BIDDERS:

1. Fred Berlanti & Son, Inc., Harrison, N. Y. (contract) — $699,048
2. Weldon Contracting Co., Westfield, N. J. — 788,955
3. Franklin Contracting Co., Newark, N. J. — 815,840

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing site	Lump Sum	$3,500.00	$6,000.00	$1,000.00
2. Roadway excavation, earth	77,916 c. y.	.50	.56	.50
3. Roadway excavation, rock	29,524 c. y.	2.00	2.40	3.00
4. Pavement excavation	15,600 s. y.	.50	.80	.50
5. Rock excavation, subsurface struct	5,000 c. y.	5.00	5.00	4.00
6. Subbase	18,000 c. y.	.90	1.20	1.00
7. Stripping	16 ac.	70.00	300.00	150.00
8. Topsoiling, 4-in	35,300 s. y.	.21	.30	.40
9. Topsoiling, 6-in	18,000 s. y.	.25	.35	.40
10. Class C conc., struct. and roadway	760 c. y.	20.00	30.00	30.00
11. White conc. vertical curb	24,200 l. f.	1.10	1.25	1.20
12. 15x8-in. white conc. sloping curb	14,300 l. f.	1.20	1.40	1.20
13. 12x8½-in. white conc. sloping curb	600 l. f.	.80	1.00	.80
14. Reset precast conc. sloping curb	340 l. f.	.40	.50	.40
15. 4-in. concrete sidewalk	5,300 s. y.	2.15	2.50	2.45
16. White conc. island paving	300 s. y.	3.40	3.80	3.75
17. Reset monuments	25 ea.	5.00	10.00	20.00
18. Sodding	500 s. y.	.60	1.00	.60
19. Subgrade	60,975 s. y.	.10	.15	.20
20. 6-in. plain conc. pavmt. surface	850 s. y.	2.60	3.00	2.95
21. 10-in. conc. pavmt. surf. (excl. rein.)	55,502 s. y.	3.20	2.90	3.30
22. 18-in. bridge approach slabs	133 s. y.	4.50	7.50	5.50
23. 8-in. plain concrete base courses	4,400 s. y.	3.25	2.30	2.40
24. Concrete pavement footings	35 c. y.	13.00	20.00	16.25
25. Pavement, type A, 1-in. thick	1,308 ton	7.50	10.00	8.75
26. Pavement, type T, 1-in. thick	1,306 ton	.....	.....	.....
27. Pavement, type A, bottom course	1,275 ton	7.50	9.00	8.75
28. Pavement, type T, bottom course	1,275 ton	.....	.....	.....
29. 3-in. mod. pen. macadam intermed. course	9,600. s. y.	.85	.75	.90
30. 4-in. macadam base course	14,750 s. y.	.80	.75	1.30
31. Inlets, type A	2 ea.	110.00	140.00	125.00
32. Inlets, type B	117 ea.	130.00	140.00	150.00
33. Inlets, type B, using existing castings	3 ea.	100.00	90.00	100.00
34. Inlets, type E	3 ea.	150.00	150.00	180.00
35. Manholes	7 ea.	175.00	140.00	210.00
36. Special manholes	4 ea.	300.00	600.00	475.00
37. Reset inlet head	1 ea.	20.00	10.00	10.00
38. Reset manhole heads	6 ea.	30.00	10.00	10.00
39. New manhole head	1 ea.	50.00	50.00	40.00
40. 12-in. rein. conc. culv. pipe	138 l. f.	2.35	1.90	2.45
41. 18-in. rein. conc. culv. pipe	6,916 l. f.	3.00	2.60	2.75
42. 24-in. rein. conc. culv. pipe	1,340 l. f.	4.00	3.80	4.00
43. 30-in. rein. conc. culv. pipe	48 l. f.	8.00	5.50	6.00
44. 36-in. rein. conc. culv. pipe	1,284 l. f.	6.00	6.60	6.50
45. 42-in. rein. conc. culv. pipe	1,050 l. f.	7.50	8.70	8.00
46. 48-in. rein. conc. culv. pipe, ext. stren	156 l. f.	10.00	12.40	11.50
47. 66-in. rein. conc. culv. pipe, ext. stren	1,032 l. f.	36.00	52.80	45.00
48. 86-in. rein. conc. culv. pipe, ext. stren	44 l. f.	65.00	82.80	65.00
49. Shoring and bracing	11 Mbm.	90.00	200.00	150.00
50. 8-in. c.i. water pipe, Class A	30 l. f.	5.00	2.80	3.50
51. 10-in. c.i. water pipe, Class A	78 l. f.	5.00	3.60	3.50
52. 18-in. c.i. culv. pipe, ext. heavy	24 l. f.	8.00	5.60	5.25
53. 6-in. pi. conc. or vitr. clay pipe	264 l. f.	1.30	1.40	1.60
54. Underdrain, type F	3,000 l. f.	1.00	1.20	1.80
55. Class B conc. in culverts	63 c. y.	20.00	45.00	60.00
56. Class C conc. in culverts	150 c. y.	20.00	31.00	45.00
57. Class D conc. in culverts	114 c. y.	20.00	25.00	30.00
58. Wood guard fence	2,000 l. f.	1.10	1.10	1.80
59. Wood barricade	68 l. f.	2.50	5.00	2.50
60. Ditching	70 c. y.	2.00	1.00	2.50
61. Found'n. excav., conc. structures	1,010 c. y.	2.50	3.00	2.50
62. Earth excav., subsurf. structures	300 c. y.	2.50	3.00	3.50
63. Earth excav., test pits	100 c. y.	3.00	3.50	3.10
64. Broken stone or screen. gravel	210 c. y.	3.00	5.00	3.00
65. Riprap slope protection	40 c. y.	10.00	12.00	15.00
66. Grouted rubble stone gutter	350 s. y.	3.50	4.00	2.50
67. Single guard fence posts	90 ea.	5.00	4.00	6.00
68. Asbestos-cement conduit, 4-in.	304 l. f.	3.25	1.50	1.25
69. Asbestos-cement conduit, 3½-in.	256 l. f.	3.10	1.00	1.15
70. Federal project marker posts	6 ea.	5.00	25.00	20.00
71. Reset wire rope railing	218 l. f.	1.00	1.00	1.00
72. Reinforcing steel for 10-in. conc. pavement	373,800 lb.	.035	.048	.05
73. Wood joint filler	9,000 l. f.	.35	.80	.75
74. 4-in. concrete joint sills	4,250 s. y.	2.00	2.50	2.50
75. Monuments (setting only)	75 ea.	2.00	5.00	10.00
76. Foundation excav., underpass	1,121 c. y.	2.50	3.75	2.75
77. Treated timber piles, underpass	3,575 l. f.	1.50	2.20	1.50
78. Concrete balustrade, underpass	231 l. f.	8.00	6.00	7.00
79. Class B conc., underpass struct	178 c. y.	40.00	61.00	45.00
80. Class C conc., underpass struct	1,311 c. y.	20.00	22.50	20.00
81. Class D conc., underpass struct.p	347 c. y.	15.00	14.50	20.00
82. Structural steel, underpass	525 lb.	.15	.14	.25
83. Rein. steel, underpass struct	49,485 lb.	.065	.065	.08
84. Waterproofing	443 s. f.	1.00	.50	.30
85. 8-in. vitr. clay pipe drains	133 l. f.	2.00	1.00	2.00
86. 12-in. vitr. clay pipe drains	80 l. f.	3.00	1.50	2.50
87. Lighting units	4 ea.	75.00	100.00	75.00
88. Transformer pit frame and cover	1 ea.	100.00	100.00	125.00
89. 2-in. conduit	240 l. f.	3.00	1.50	1.50
90. Cofferdam flooring	2.5 Mbm.	100.00	100.00	150.00
91. Foundation excavation, bridge	560 c. y.	2.50	5.65	7.00
92. Concrete balustrade, bridge	113 l. f.	8.00	6.00	7.00
93. Class B conc., bridge struct	188 c. y.	40.00	41.00	32.00
94. C ass C conc., bridge struct	252 c. y.	30.00	25.75	35.00
95. Rein. steel, bridge structures	19,500 lb.	.065	.07	.08
96. Clearing site, Ingersoll-Rand Bridge	Lump Sum	1,000.00	1,200.00	1,000.00

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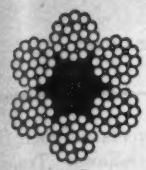
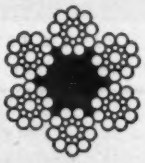

6x19 Filler Wire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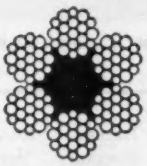
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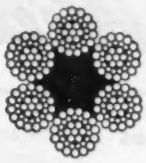
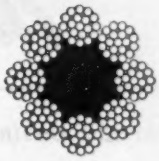

6x37 Extra Flexible


8x19 Extra Flexible

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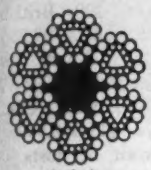
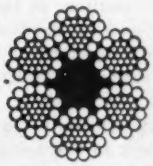
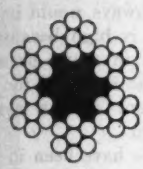
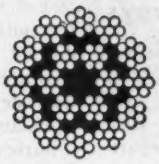
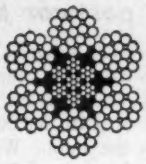
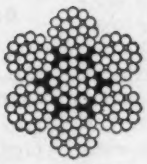

Style B Flattened Strand

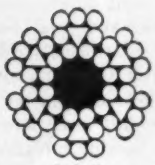

Style G Flattened Strand


6x7 Haulage


18x7 Non-Rotating


6x19 Wire Rope Center


6x19 Metallic Core


Style D Flattened Strand

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Maximum wire rope efficiency is obtained only when the rope used is of the construction, grade and type best suited to the particular conditions under which it is to work. Ability to make proper selection comes with experience. We shall be glad to have you consult with us on any wire rope problem you may have.

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(Continued from page 57)

Colorado basin states discuss developments

A meeting of the Colorado Basin States Committee at Denver, Colo., on Nov. 10 and 11 discussed an inventory of future irrigation and power possibilities prepared by the United States Bureau of Reclamation. The 400-page inventory, which is the tentative draft of a report to Congress and the President, was reviewed to determine how much of the Colorado River's water would be required to provide for fullest practical development of the drainage basin, and what uses in the upper and lower basins, according to the Colorado River Compact, may be expected.

It appeared from the inventory data that the full river flow is about sufficient to provide for all devedopment.

Question was raised by representatives of the two basins concerning the criteria applied to project selection in preparing the inventory. Extended discussion resulted in an understanding to assist the Bureau of Reclamation in revising the inventory. Several of the states will prepare commentaries and suggestions, and submit them to the bureau within the next three months.

All seven states of the Colorado River basin were represented. Representatives of Los Angeles Bureau of Power and Light and of the Metropolitan Water District also attended.

• • •

British Columbia plans costly postwar highways

A nine-project program of postwar construction calling for the building of 6,000 miles of highways at an estimated cost of $210,000,000 has been prepared by the Public Works Department of the Province of British Columbia, Canada, and has been submitted to the dominion government for approval as a part of its plan to provide postwar employment on a large scale.

The nine projects and their estimated costs are as follows: Trans-Canada Highway, $44,167,000; Southern Trans-Provincial, $53,508,000; Island Highway, $18,623,300; Northern Trans-Provincial, $24,661,100; British Columbia-Yukon-Alaska, $23,709,300; Cariboo, $15,458,000; North Thompson, $7,034,300; Vancouver-New Westminster express highway, $11,237,000; parks highways, $11,858,900.

The breakdown of costs is: Land purchase, $3,260,000; labor, $113,882,200; materials, $83,270,000; and administration, $9,845,500. The average cost of the highways would be $35,852 per mile. This is high because of the difficult terrain in many parts of the province and the necessity for an east-west development over a north-south mountain system.

Survey parties have been in the field during the last two summers locating the major projects especially for the connections between the Alaska Highway and the road systems of the southern part of the province.

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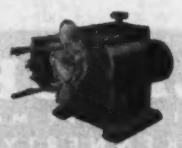

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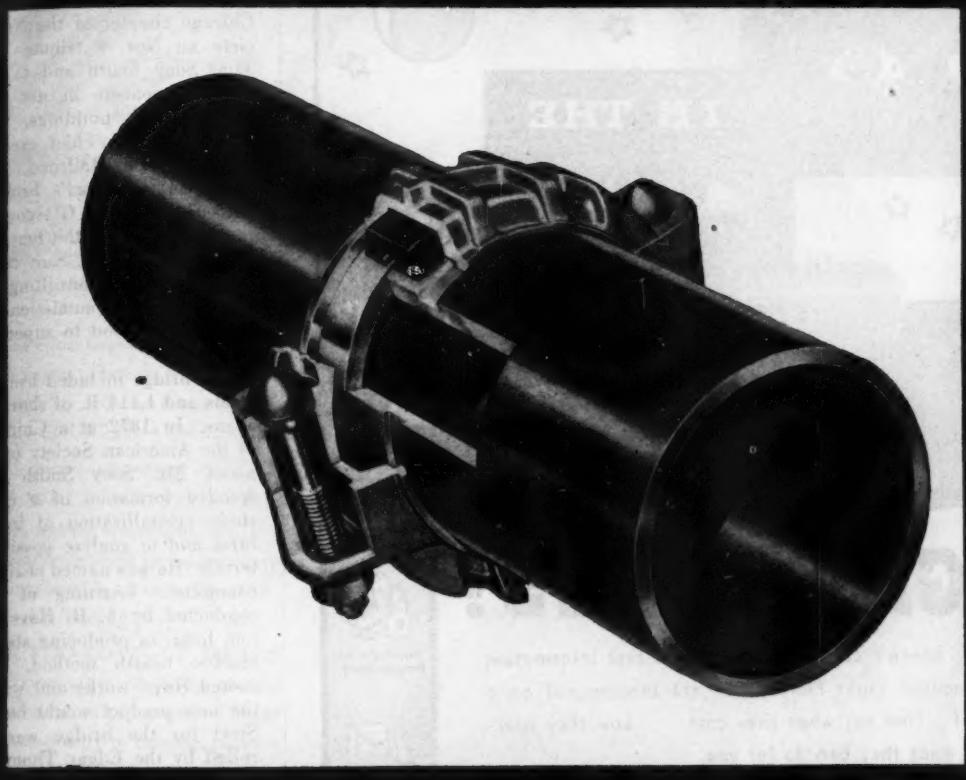

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Newcomen group honors early engineers

At the eighth annual dinner of the Chicago chapter of the Newcomen Society on Nov. 9 tribute was paid to Wm. Sooy Smith and to Wm. L. B. Jenney, pioneers in use of steel for bridges and buildings, respectively. H. B. Voorhees, chief executive officer of the Alton Railroad, presented a paper on that road's bridge over the Missouri River at Glasgow, Mo., completed in 1879 as the first steel bridge in the world. Wm. Sooy Smith, prominent New York consulting engineer at that time, was commissioned to design the structure and to supervise its construction.

The bridge included five 314-ft. truss spans and 1,114 ft. of shorter approach spans. In 1872 at a Chicago meeting of the American Society of Civil Engineers, Mr. Sooy Smith had recommended formation of a committee to study crystallization of iron in structures and to analyze possible new materials. He was named chairman of that committee. Learning of experiments conducted by A. R. Hays of Burlington, Iowa, in producing steel by a new electric hearth method, Sooy Smith visited Hays' works and was convinced the new product would be acceptable. Steel for the bridge was made and rolled by the Edgar Thompson Works of Carnegie-Illinois Steel Co. The original bridge was replaced by the present structure in 1899.

Elmer C. Jensen, partner of the Chicago architectural firm of Mundie, Jensen, Bourke & Havens, outlined the history of the Home Insurance Building in Chicago, the first building of skeleton design. The building, 10 stories and 144 ft. high, was completed in 1886 at the northeast corner of La Salle and Adams streets. It was torn down in 1931 to make way for the present Field office building.

Wm. L. B. Jenney, founder of Jensen's architectural firm, won a contest conducted by the insurance company for the best design and was named architect for the job. He conceived the idea of a skeleton frame, a radical departure from the prevailing wall-bearing design. Columns and floor beams were to be of iron, but before the project was completed some Bessemer steel beams were substituted for the iron members.

The Newcomen Society was organized in England as an engineering historical society. Ralph Budd, president of the Burlington Railroad and head of the Chicago group, introduced the speakers. Former vice-president Charles G. Dawes was general chairman of the meeting, attended by 150 engineers and architects.

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Elections and Activities

Ben H. Martin of Easley, S. C., was elected president of the Carolinas Branch of the Associated General Contractors of America at the annual meeting at Pinehurst, N. C., October 30-31. He succeeds C. P. Street of Charlotte, N. C., Edwin L. Jones of Charlotte, N. C., was elected vice president, and Robert H. Pinne of Gastonia, treasurer, N. K. Dickerson, Jr., of Monroe, N. C., W. T. Potter of Greenville, S. C., Frank P. Morris of Greenville, S. C., C. P. Ballenger of Greenville, S. C., George W. Kane of Roxboro, N. C., and D. W. Winkelman of Southern Pines, N. C., were elected directors.

The organization adopted a resolution asking the 1945 session of the North Carolina Legislature to repeal a section of the 1937 state revenue act which provides for transferring approximately $2,500,000 from the highway fund to the general fund if necessary to prevent a deficit in the latter.

E. E. Eddy, Spokane, Wash., district manager for the Sullivan Machinery Co. is the new president of the Associated Engineers of Spokane. He fills the unexpired term of P. J. Shenon, formerly in charge of the Spokane office of the United States Geological Survey, who is now on special assignment for the government in the South Pacific.

The Washington State Reclamation Association, held an organization program early in November in Yakima to develop a program. The new association replaces the old Washington Irrigation Institute organized 30 years ago to contribute to the development of irrigation in the eastern part of the state.

George Goudreau, Cleveland, has been elected president of the Ohio Home Builders Association in the group's first annual convention, held in Canton. Others elected were: J. B. Haverstick, Dayton, vice president; A. A. Knoch, Canton, secretary; and Will B. Marquard, Cleveland, treasurer.

These five members of the Okeechobee Flood Control District Board, Florida, were reappointed by Governor Holland for 4-year terms. Jacob M. Boyd, West Palm Beach, Russell G. Snow, Fort Lauderdale, F. Deane Duff, Clewiston, G. Carl Adams, Miami Springs and Carl Hanton, Fort Myers.

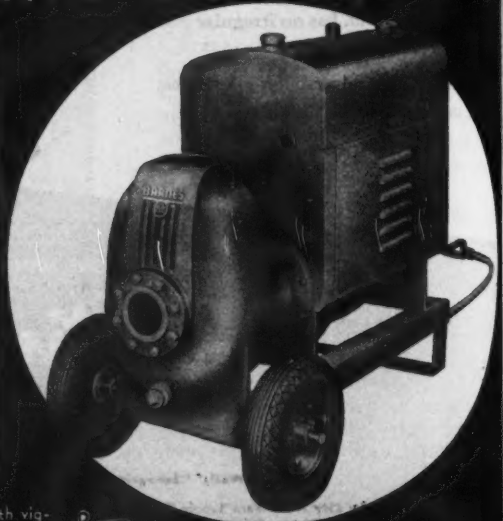
Frank Kerekes, professor of structural engineering at Iowa State college, has been elected president of the Iowa section of the American Society of Civil Engineers to succeed Lawrence C. Crawford, Iowa City, district engineer of the U. S. Geological Survey. Other officers elected were: Prof. Earle L. Waterman, head of civil engineering at the University of Iowa, vice-president, and Prof. L. O. Stewart of Iowa State college, secretary-treasurer. Directors are City Engineer John M. Tippee of Des Moines and James P. McKean, assistant professor of general engineering at Iowa State college. Section voted to amend its constitution to permit it to act as a collective bargaining agent for members.

Beardsley Ruml has been re-elected chairman of the Business Committee of the National Planning Association. He is chairman of the Federal Reserve Bank of New York.

MORE GALLONS OF WATER FOR YOUR PUMPING DOLLAR . . .

That's your performance promise from the amazing new stream-styled line of Barnes Automatic Centrifugals. Based on proven wartime experience . . . gruelling ship salvage requirements by the Navy, tough hurry-up construction jobs where dewatering had to be done fast by Army Engineers and Seabees, and many other extreme wartime assignments . . . these Barnes pumps have successfully met the severest wartime demands. The Services needed increased volume capacities, and Barnes pumps were redesigned to produce them.

A new standard in appearance and performance has been established, and now pumps are rolling off the production lines at Barnes modernized plant . . . ready to go to work for you . . . to assure you "More Gallons of Water for Your Pumping Dollar".



DISTRIBUTORS: If you are looking for a "hot" line, with vigorous hard hitting selling support, contact us immediately. A number of territories are still available. Write, wire or phone.

BARNES MANUFACTURING CO.

Quality Pump Manufacturers for Nearly 50 Years

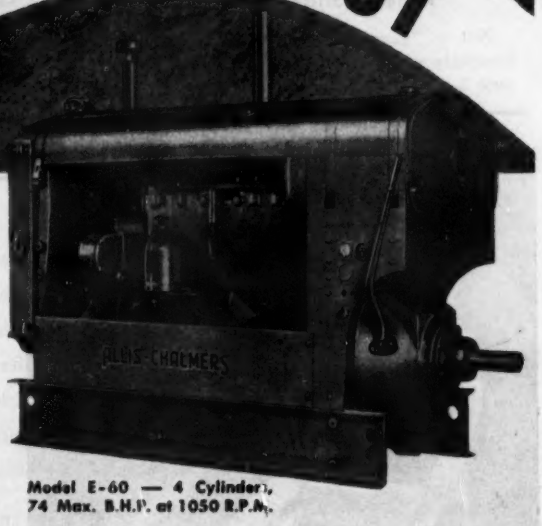
MANSFIELD, OHIO

OUTPUT DEPENDS ON INPUT

A machine is no better than its engine. That's why it is important to use reliable power which performs consistently, day after day, with minimum time out.

Designed for heavy-duty tractor service, Allis-Chalmers engines are widely used in the construction industry . . . power crushers, conveyors, pumps, screens, hoists, shovels, generators, compressors and other equipment.

Medium speed, high in torque, they hang on to severe overloads . . . are ideally suited to continuous or intermittent service. Available with various accessories to fit the application. Parts and replacements obtainable everywhere! Figure on them for postwar. Get all the facts. See your Allis-Chalmers dealer.



Model E-60 — 4 Cylinders, 74 Max. B.H.P. at 1050 R.P.M.

POWER UNITS

FIVE SIZES

Gasoline or Low Grade Fuels

Model B-15—4 Cylinders, 24 Max. B.H.P. at 1500 R.P.M.
Model W-25—4 Cylinders, 31.5 Max. B.H.P. at 1300 R.P.M.
Model U-40—4 Cylinders, 45 Max. B.H.P. at 1200 R.P.M.
Model E-60—4 Cylinders, 74 Max. B.H.P. at 1050 R.P.M.
Model L-90—6 Cylinders, 110 Max. B.H.P. at 1050 R.P.M.

ALLIS-CHALMERS

New Aids to the Constructor

Water Analyzer

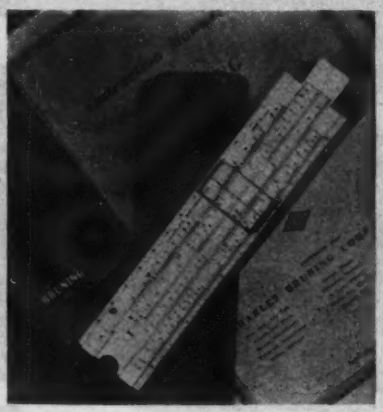
A new endpoint, based on the foam-meter principle, is the leading feature of water analysis apparatus known as the Aero-Titrater. This endpoint is said to be incapable of mistake and reproducible with a high degree of precision. Determinations are made within ten minutes. The analyzer, which is supplied calibrated and ready for use, has no moving parts to wear out and no delicate features to go out of adjustment.

The Aero-Titrater's vital parts are of durable plastic construction, and it is said to function well in the presence of interfering substances; its great versatility makes it applicable to a large range of water problems.—*Chief Chemical Corp., 55 West 42nd St., New York 18, N. Y.*

• • •

Pocket Slide Rule

Not a "duration substitute," but a carefully made precision instrument, a new 5-in. pocket slide rule, No. 2401, shows A, B, C1, C, D, K, S, L and T scales for a wide range of service. A



notable feature is the precision of the molded-in graduations, which will not lose visibility through use.

Three screws in the back of the rule provide a simple adjustment for tension on the slide. The indicator is of glass and is easily replaceable in the event of breakage; it is enclosed in a frame of stainless steel that holds it firmly in place and eliminates wobble.—*Charles Bruning Co., Inc., New York and Chicago.*

• • •

Tinning Flux

Designed to promote uniformly successful tinning of cast iron prior to brazing, a new flux, Airco Hi-Bond, may be applied as a water-mixed paste or as a powder sprinkled on a heated surface. This flux, it is claimed, overcomes the difficulties encountered in tinning cast iron, due to its graphitic nature.

This product is available in 1-lb. glass containers. The manufacturer points out that it does not take the place of regular brazing flux.—*Air Reduction Sales Co., 60 East 42nd St., New York 17, N. Y.*

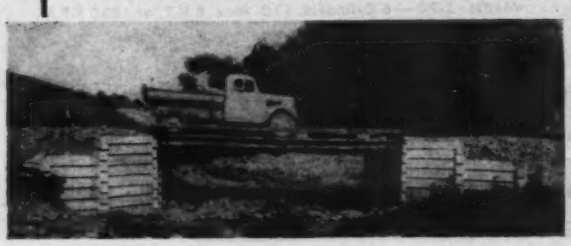
• • •

Heating Nozzle

A leading feature of a new multi-flame heating nozzle is the incorporation of an outer air mantle to protect

Thirty foot radius curved vertical wall erected at Chambersburg, West Virginia, for American Gas & Electric by Burns and Roe, engineers.

Salt Lick bridge, Braxton County, West Virginia. Closed face cribbing set 48 inches below water line.



Time Saving — Labor Saving
UNIVERSAL CRIBBING
is the answer to your construction problems

You can speed the job with Universal Concrete Cribbing. Requires no forms, no skilled labor, no special equipment, no delay for curing. Minimum foundation excavation, dumped as fill in section adjoining!

Pre-cast, open-face cribbing and closed-face cribbing is stocked in our 26 strategically located plants, for prompt delivery with short haul. Let us help you with some of your construction problems.

Write today for complete data on Cribbing

UNIVERSAL
CONCRETE PIPE CO.
297 S. High Street, Columbus 15, Ohio
Eastern Sales Division—1824 Graybar Bldg., N. Y. City

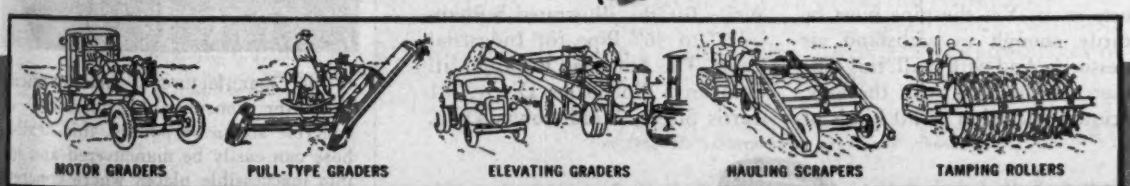
THEY'LL SOON BE BACK *in "Civies"...*

For some three years practically every machine leaving the Adams shipping dock has been dressed in the war paint of the Army or Navy. Hundreds of Adams motor graders, leaning wheel graders, elevating graders—including specially designed pull-type graders and tamping rollers for the airborne engineers—have been shipped to all parts of the world. Reports from all sources indicate that they are doing a grand job in the building and reconstruction of air bases, landing strips, roads, etc.

In the very near future—in time for spring work—Adams equipment should again be available for delivery for civilian uses subject, of course, to whatever government restrictions are in effect at that time. In connection with your 1945 planning see your local Adams dealer now about the machines you need. He's alive to the possibilities and can be of real service to you.

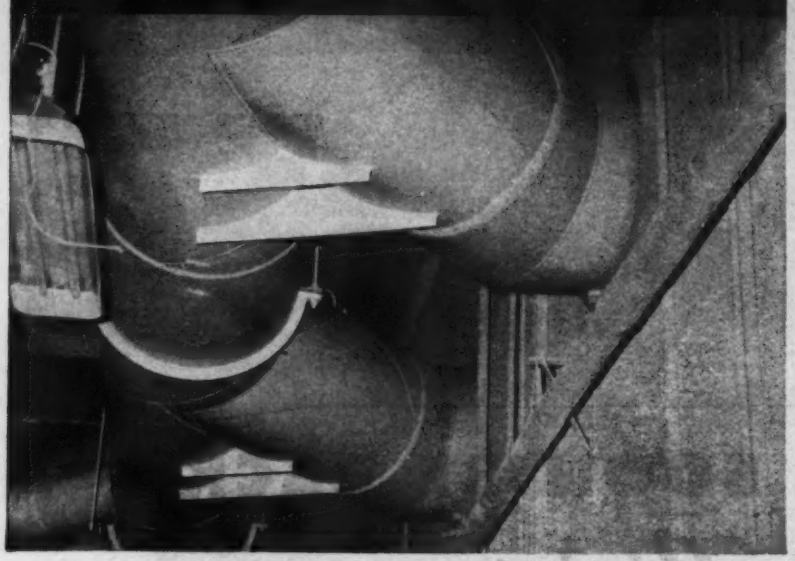
J. D. ADAMS COMPANY • INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



ADAMS ☆ ROAD-BUILDING AND ☆ EARTH-MOVING EQUIPMENT

"Now Give It An ARCTIC BLAST!"



Altitude Exhaust System header in basement of Engine Research Building; Aircraft Engine Research Laboratory, Nat'l Advisory Committee for Aeronautics.

There isn't a dull moment in the life of an engine-testing laboratory's piping system. Its job is to conduct air that simulates all kinds of climatic conditions. Hot blasts often follow frigid air under forced draft—with a partial vacuum sandwiched in for good measure.

This is another piping task where all the advantages of prefabricated ARMCO Spiral Welded Pipe are utilized to the fullest.

LIGHT, STRONG WALLS

Light walls are needed to permit fast temperature changes; there can be no long and costly delays while the piping temperature adjusts itself. Yet the pipe must be sturdy enough to withstand air pressures. And with it all, this pipe must not interfere with the easy, accurate operation of all kinds of valves and measuring devices.

FEWER FLANGES

For years ARMCO Spiral Welded has been used for many kinds of industrial jobs. Fittings come welded to straight pipe runs. This means fewer flanges, fewer joints — less chance for leaks. Pipe is available with flanged joints or with ends prepared for field welding and mechanical joints. It is supplied mill-coated or galvanized.

We'll be glad to help with your special industrial piping problems. Sizes of ARMCO Spiral Welded range from 6 to 36 inches; wall thicknesses from 9/64 to 1/2-inch. Write for the illustrated bulletin —"6" to 36" Pipe for Industrial Uses." The American Rolling Mill Company, Pipe Sales Div., 3081 Curtis Street, Middletown, Ohio.

EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

ARMCO 6" to 36" STEEL PIPE

the nozzle head against deflected heat. The nozzle, designed particularly for use with oxygen, liquefied petroleum gases or natural gas, fits all standard

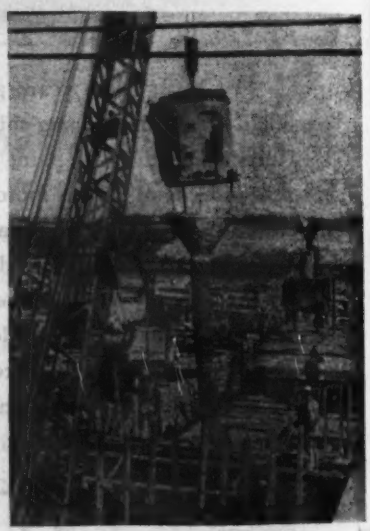
Victor welding torch butts, or can also be sold complete.

The internal design of the nozzle is such that the cool and preheated gases carry away a quantity of accumulated heat, it is claimed, and thus become preheated for proper combustion.—*Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif.*

. . .

Cement-Placing Hose

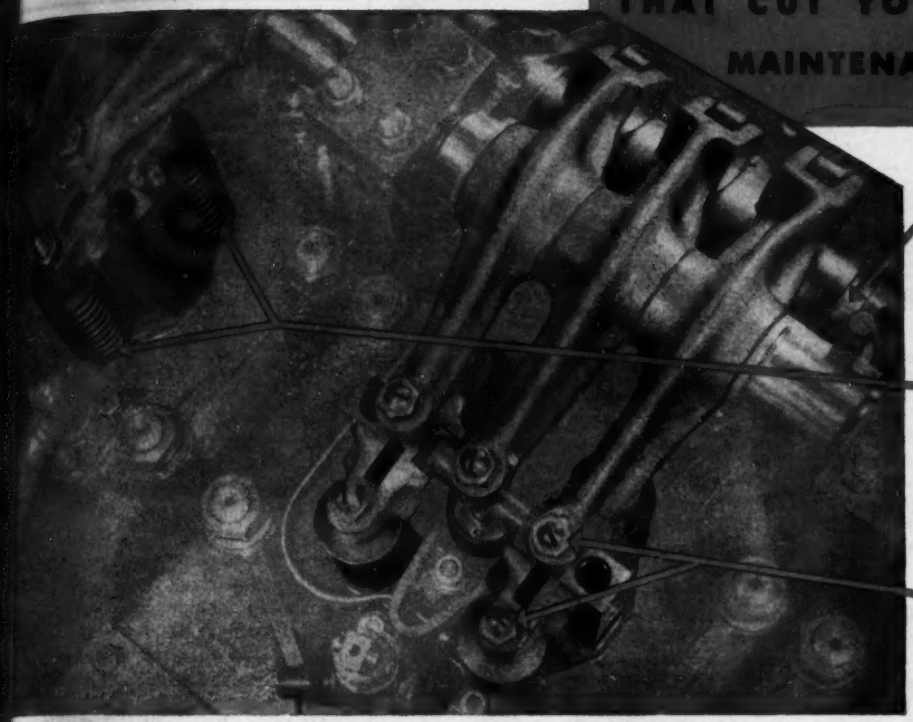
Already proved in the roughest kind of service, U. S. Elephant Trunk hose will drop concrete speedily and efficiently into the proper spot, according



to the manufacturer's announcement. Wherever considerable quantities of concrete are to be poured, this flexible hose can easily be maneuvered and led into inaccessible places where concrete could not be dropped directly.

Elephant Trunk hose comes in sizes 4 in. to 20 in. inside diameter. Any desired funnel may be clamped on with a suitable friction band.—*United States Rubber Co., Rockefeller Center, 1230 Sixth Ave., New York, N. Y.*

THREE HENDY FEATURES THAT CUT YOUR DIESEL MAINTENANCE COSTS



1. OVERHEAD CAMSHAFT

Reduces maintenance by eliminating parts and complicated linkage.

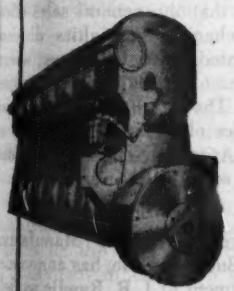
2. DIRECT-ACTUATED DUAL VALVES

Reduce maintenance by prolonging valve-stem and guide life.

3. HYDRAULIC TAPPETS

Reduce maintenance by eliminating manual tappet adjustment.

HENDY SERIES 50 DIESELS



Hendy Diesels—6 or 8 cylinders, from 350 to 675 hp—are designed for marine and industrial use—or with Hendy generators, as complete electric generating plants.

Write today for complete data, ask for the new Hendy Series 50 Diesel Engine Catalog.

These three features of the Hendy Series 50 Diesel contribute directly to the lower maintenance costs a successful Diesel operator expects and must have.

The overhead camshaft eliminates the linkage of push-rods and valve-lifters for each cylinder—cutting maintenance by reducing the number of wear points. The valve mechanism, pressure-lubricated through hollow rocker-arm shafts, lasts longer because positive-acting cross heads, or dividers, assure even pressure on dual intake and exhaust valves and eliminate side thrust. Hydraulic tappets automatically maintain correct tappet clearance at all times, making manual adjustment unnecessary.

Any one of these features in a Diesel is an aid to lower maintenance costs. But the Hendy Diesel has all three. Even more, the Hendy Diesel has many other advantages never before combined in a single engine. Investigate the advantages of this modern Diesel today.

JOSHUA HENDY IRON WORKS
ESTABLISHED 1856
SUNNYVALE, CALIFORNIA

45-V

Branch Offices: BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • ST. LOUIS • WASHINGTON • LOS ANGELES

on ROGERS TRAILERS

EVEN airplanes "bum a ride" on ROGERS TRAILERS in this era of high-speed, all-out industrial production.

In addition to transporting heavy machinery of all kinds on the production front, ROGERS TRAILERS are doing a tremendous job in speeding the manufacture of weapons for war.

Deck houses for Victory ships . . huge coastal defense guns . . giant tanks . . all are speeded towards completion and rushed to the fighting fronts on ROGERS TRAILERS.

It's a tough proving ground but ROGERS TRAILERS have proven their ability to "deliver the goods". New models which will be available when war contracts are completed will be even better engineered and constructed . . will "deliver the goods" more efficiently than the thousands which have been used by industry for many years.

EXPERIENCE *builds 'em*
PERFORMANCE *sells 'em*

ROGERS BROS. CORPORATION
ALBION - PENNA.

THE COMPLETE LINE

Erie builds *all* types of buckets in various weights and capacities to meet the job and operating conditions. Choose the correct bucket for the job and you get the maximum speed and output. Write for broadside on the complete Erie line of buckets

ERIE STEEL CONSTRUCTION CO · ERIE, PA.
Aggre Meters · Buckets · Concrete Plants · Traveling Cranes

Manufacturers' Activities

Appointment of William M. Kauffmann as assistant to the chief engineer in charge of diesel engine development for Mack Trucks, Inc., has been announced. He will supervise enlarged facilities for research and development.

A graduate of the Illinois Institute of Technology, Mr. Kauffmann has had 20 years experience with diesels. He previously was assistant chief engineer of the engine research and development division of the Worthington Pump and Machinery Co., Buffalo, and chief development engineer of the National Transit Pump and Machine Corp., Oil City, Pa.

Other important posts held by Mr. Kauffmann include chief design engineer of Baldwin De La Vergne, Philadelphia, and research engineer of the Superior Engine division of the National Supply Co., Springfield, Ohio.

Michigan Power Shovel Co., Benton Harbor, Mich., has appointed the Rupp Equipment Co., 101 Great Arrow Avenue, Buffalo 16, N. Y., to handle its power shovels in that area.

The Wickwire Spencer Steel Co. has announced that the general sales office of the mechanical specialties division will be located at Clinton, Mass., where the products of that division are manufactured. The mechanical specialties general sales office has been located at 500 Fifth Avenue, New York. A district sales office will continue there.

The 90-year-old Shunk Manufacturing Co. of Bucyrus, Ohio, has announced the appointment of J. R. Randle as field service engineer. He will travel in the states and Canada cooperating with customers.

He has had much experience in the construction and contracting fields, having been with Ingersoll-Rand for 20 years; Illinois Powders Manufacturing Co. two years and two years with the Cleveland Rock Drill Co.

The Robert W. Hunt Co. has made these changes in organization: W. H. Savage has been made manager of the general equipment and materials department, G. W. Stierer, manager of the

tructural steel department, and H. A. Ford, manager of the railway car department, all at Chicago.

C. F. HAWKER, chief engineer of the Armstrong Cork Co., Lancaster, Pa., has been elected vice-president in charge of manufacture.

Mr. Hawker was graduated in 1917 with a B.S. degree from Ohio State University. He entered the Army, serving as instructor in the aviation ground school until his discharge. His first civilian job was resident engineer on central station construction work for Electric Bond & Share Co. in Hartsville, S. C. He served successively Dayton Power & Light Co., E. W. Clark Engineering Corp., Commonwealth & Southern Corp., and Tennessee Electric Power Co. He was named Armstrong's assistant chief engineer in 1936 and chief engineer the following year.

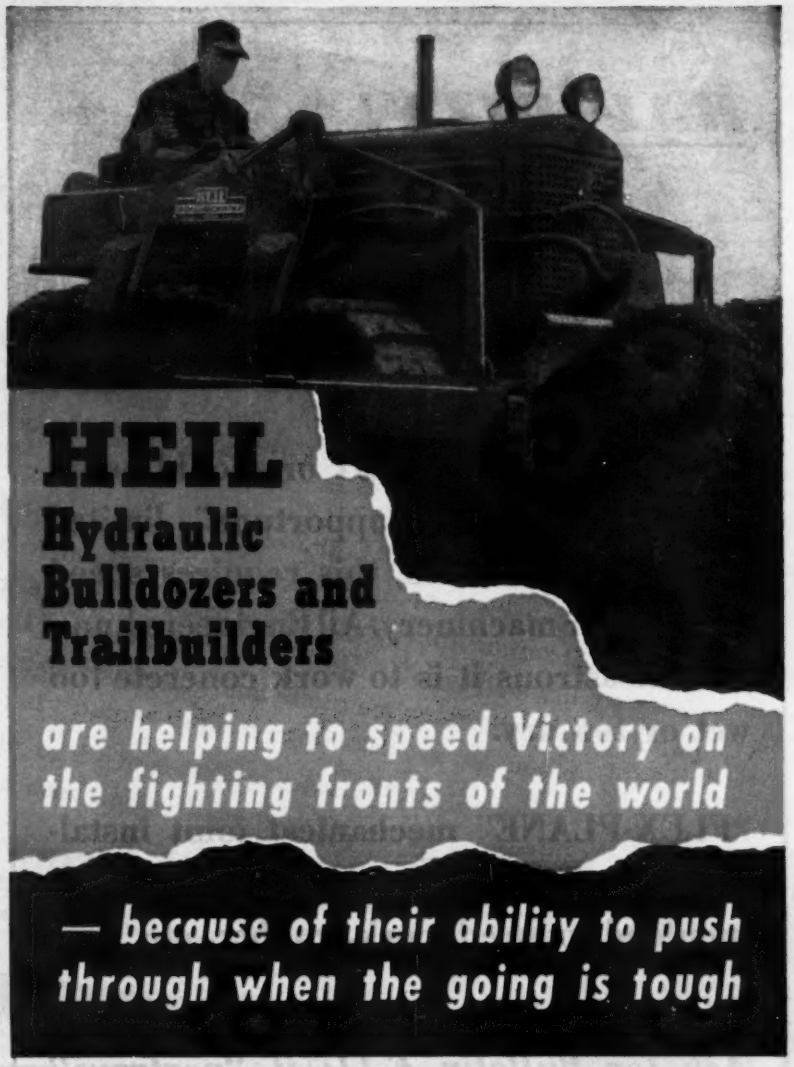
Vice-president C. J. Backstrand, who has been directing the company's manufacturing operations, will work with the president's office in the administration of the company's general affairs. Succeeding Mr. Hawker as chief engineer is George A. Reinhard, Jr.

THE OFFICES of the Clay Sewer Pipe Association, Inc., of Pittsburgh, Pa., have been moved to 50 West Broad Street, Columbus, Ohio. The administrative and field personnel will serve with H. C. Maurer as president and Benjamin Eisner as chief engineer.

William F. Lahl, formerly associated with Crane Co., Chicago, in engineering and sales divisions, has been elected vice-president of the Belknap Manufacturing Co., Bridgeport, Conn., for industrial sales and engineering. Mr. Lahl has had 25 years experience in the industrial valve industry, and served 18 months on the War Production Board as consultant in the valve and fittings section.

The Lone Star Cement Corp. of New York has re-established a district sales office in Tulsa, Okla. to cover Oklahoma, southern Kansas and northern Texas. J. H. Topper is the representative.

Latin American industrialists are to be offered an opportunity to provide groups of employees with free technical and practical instruction in precision industrial instrumentation in this country it is made known by E. B. Evleth, vice-president and general manager of Brown Instrument Co., precision indus-



These efficient, dependable, Heil Bulldozers and Trailbuilders, are built to work as a smooth-operating unit with Cletrac Tractors.

Heil engineers have pioneered the modern practice of replacing heavy cast members with welded box sections that are lighter, stronger, and easy to repair in the field without costly delays. Sound engineering design, reduced to the utmost simplicity, guarantees few service interruptions and cuts maintenance costs.

Balanced loads, backed by full length crawler drive, result in effective digging and dirt-moving performance, plus big savings in maintenance costs on both blade equipment and tractor.

Enjoy maximum work and satisfaction with a Heil Bulldozer — designed to move "pay dirt" quickly, easily and economically.

R-34

See your Cletrac Tractor Distributor

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

RAPIDITY!

UNIFORMITY!

SATISFACTORY!

Contraction joints MUST or should be installed within the "opportune" limited time of ten minutes; this requires speed and proper machinery. All Engineers know how disastrous it is to work concrete too wet or too dry.

"FLEX-PLANE" mechanical joint installers for all types of joints—ribbon, premoulded, poured, cork, rubber, etc.

Ask for Bulletin E-11; it "portrays" other things you know!

FLEXIBLE ROAD JOINT MACHINE CO. WARREN, OHIO

DRILLING
ANYWHERE

We look into the earth

PENNSYLVANIA DRILLING COMPANY
PITTSBURGH, PA.

MITCO
OPEN STEEL FLOORING

Pressure Formed
90% Open Area
Easy to Install
Hendrick Manufacturing Company
[illegible] Street, Carbondale, Pa.

trial instrument division of Minneapolis-Honeywell Regulator Co. Instruction will be at the Brown School of Instrumentation in Philadelphia, Pa.

GEORGE W. SMITH, 57, a branch manager of the Joseph T. Ryerson Co. of Chicago, died in Milwaukee, Wis., recently. Mr. Smith received his civil engineering degree from McGill University, Montreal. He was resident engineer for the Raulf Construction Co. when it built the Milwaukee Auditorium in 1908. In 1913, he left Milwaukee to become president of the Concrete Mixing & Plowing Co. He returned in 1915 and became associated with the George Gibbs Steel Co., later forming the Reed-Smith Co., which was purchased by the Ryerson firm 20 years ago.

MAJ. WILLARD SIMON, of Youngstown, Ohio, has been named assistant district sales manager of Republic Steel Corp.'s Cincinnati office. Major Simon has been released from the Army Service Forces production division headquarters. He formerly was with Republic's Washington office and was assistant sales manager at Boston and Buffalo.

PRODUCTION and shipment of Copperweld wire reached the highest level in the history of the company during August, William J. McIlvane, executive vice president of the Copperweld Steel Co. of Glassport, Pa., has reported.

GALE H. FEGLEY ended 26 years of service with Shunk Manufacturing Co., Bucyrus, Ohio, when he resigned as sales manager recently. His experience in the construction equipment blade industry brought his appointment to the advisory committee of the War Production Board in Washington.

ELECTION of Ellis L. Spray as vice president and general manager of the Westinghouse Electric Elevator Co., subsidiary of the Westinghouse Electric and Manufacturing Co., has been announced following the retirement of Frank C. Reed who had been president of the elevator company since 1936 and a vice president of the parent company since 1942. Mr. Spray will continue his activities as assistant to the president in charge of the headquarters manufacturing division of the parent company.

A. J. TOWNSEND, chief mechanical engineer of the Lima Locomotive Works,

MOTOR TRUCK NEWS FLASH!

FWD TRUCKS AVAILABLE FOR CIVILIAN PURCHASE ON AND AFTER JANUARY 1, 1945

GOOD NEWS — FWD four-wheel-drive trucks, pre-eminent in war services, with production previously restricted almost exclusively for the military, are soon to be available for motor transport, highway, utility, oil fields, and other essential civilian services.

Recent directive from the WPB provides for production of substantial number of FWD trucks in a wide variety of models and types, 2½ to 15 tons capacity; such trucks to be built only for essential civilian uses. FWD trucks built under this release will be available for purchase on and after January 1, 1945. Deliveries will be made in keeping with priority of orders as received; immediate action and prompt placing of orders is urgent to assure delivery before limit of production is reached.

Write—wire—or phone us directly, or the nearest authorized FWD dealer for full information and your eligibility to purchase under these new rationing regulations.

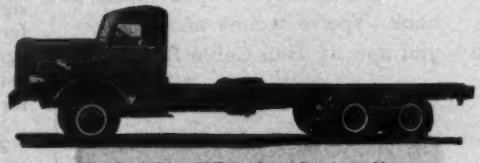
THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
CANADIAN FACTORY: KITCHENER, ONTARIO

FWD TRUCKS

These and other FWD Trucks, 2½ to 15 tons capacity, available to qualified purchasers.

D's "H" series tractor trucks with four-wheel drive and ss vehicle weight ratings from 40,000 lbs. to 60,000 lbs. wered with gasoline engines ranging from 100 to 120 rsepower on wheelbases from 120" to 144" in conventional or cab-over-engine types.

" series FWD's with gross vehicle weight acities of 22,000 to 28,000 lbs. Powered h 125 h.p. gasoline engines, 5 speed nsmission, 11:00x20 tires, wheelbase 150". Four wheel drive.



Six-wheel drive FWD trucks with gross vehicle weight capacities of 55,000 lbs. Powered with either gasoline or diesel engines of 150 and 200 horsepower. Wheelbase from 214½" to 276".

Straight trucks in FWD's "H" series range 17,000 to 20,000 lbs. gross vehicle weight capacity with wheelbases from 144" to 154" gasoline engine powered with power plants from 100 to 120 horsepower and with four-wheel drive.

ity Line Construction and Maintenance cks by FWD with 5 and 7 man cabs, cial power-take-offs and line bodies. Pow- d with 115 h.p. engine on 144" wheel- e with four-wheel drive, 5 speed trans- ion, 144" wheelbase and 9:00x20 tires.

FWD's four-wheel drive Road Maintainer — built for underbody scraper use with extra heavy frame and other features that make it the ideal unit for street and road maintenance. Engine 115 h.p. — 5 speed transmission — 8:25x20 dual tires.

"M" series FWD's powered with either gasoline or diesel engines ranging from 150 to 200 h.p. and with capacities ranging from 30,000 to 42,000 lbs. gross vehicle weight. Four wheel drive.

with HEIL

Cable Dozers

you get more penetrating power at the blade . . . more yardage

Enjoy dependable, low-cost operation — move "pay dirt" economically

Heil Cable Dozers are doing an outstanding job in clearing the way for our armed forces. Just as you have profited by top-notch Heil performance in your earth-moving jobs, so do the Army engineers in their efforts to move dirt as quickly as possible with a minimum of delay for service and maintenance.

With Heil Cable Dozers, you get more drive — more penetrating power at the blade so that you can move more "pay dirt" with each load — quickly — economically. You get a clean-cut job — you can cut at a desired depth—accurately and smoothly. End-tilt adjustments and blade-angling are quickly and easily made.

Heil Cable Dozers are engineered throughout for "tops" in performance and savings for your pocketbook. You're money ahead when you specify Heil Cable Dozers.

Write for bulletins

SEE YOUR INTERNATIONAL TRACTRACTOR DEALER

R 33

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

Inc., has been appointed vice president in charge of engineering. Henry Barnhart, manager of the shovel and crane division, has been appointed vice president in charge of that division.

JAMES R. TRAVIS, formerly with the Sperry Gyroscope Corp., has been appointed chief tool engineer for the Harnischfeger Corp., Milwaukee, Wis. He will have charge of all tool and jig design and allied activities.

WALTER A. OLEN, D. J. Rohrer and Carl E. Ateiger have been reelected directors of the Four Wheel Drive Auto Co., Clintonville, Wis.

HOWARD P. FAUST, Buffalo, N. Y., president of the R. G. Wright Co., has been elected president and general manager of the Berlin-Chapman Co., Berlin, Wis., to succeed Frank D. Chapman, resigned. John Richmond has been appointed resident manager, and John Gillette works manager.

STEVENS A. BENNETT has been elected a vice president of the United States Steel Co. subsidiary, the United States Steel Products Co., in charge of the Bennett Manufacturing Division, Chicago and New Orleans. He is the former president of the Bennett Manufacturing Co., Chicago. The assets of that company were recently acquired by the United States Steel Products Co. C. C. Burford, Urbana, Ill.

THE DIRECTORS of the Kennedy Valve Mfg. Co., of Elmira, N. Y., have announced the election of Leon H. Marsh as vice-president and sales manager. Mr. Marsh has been with the company for more than 25 years. He will be in charge of sales and public relations of the company, which manufactures iron-body and bronze valves; malleable iron, bronze, and cast iron pipe fittings, fire hydrants, and valve specialties.

JAMES R. WHITE, 50, sales director for the Preload Co., engineers and designers, of New York, died recently. Before joining the company four years ago, Mr. White was a technical advertising and sales executive in New York for more than twenty years.

AFTER a 2-year leave of absence, Orval Ohnstad has returned to Pioneer Engineering Works, Minneapolis, Minn. In 1942 Mr. Ohnstad left to work as a quarry superintendent for Johnson, Drake & Piper Co. His first assignment was in Eritrea, East Africa, where he set up and operated a large quarry plant. After one year he returned to New York. Immediately, he was hired by the Mc-Williams Dredging Co. and sent to Greenland to set up and operate two crushing plants.

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THIS Bull Dog Transmission Belt is operating on a Beater drive in a paper mill. This is a heavy duty job and the belt works under high stress.

Bull Dog meets the severest requirements of endurance adaptability, long life, and minimum operating expense.

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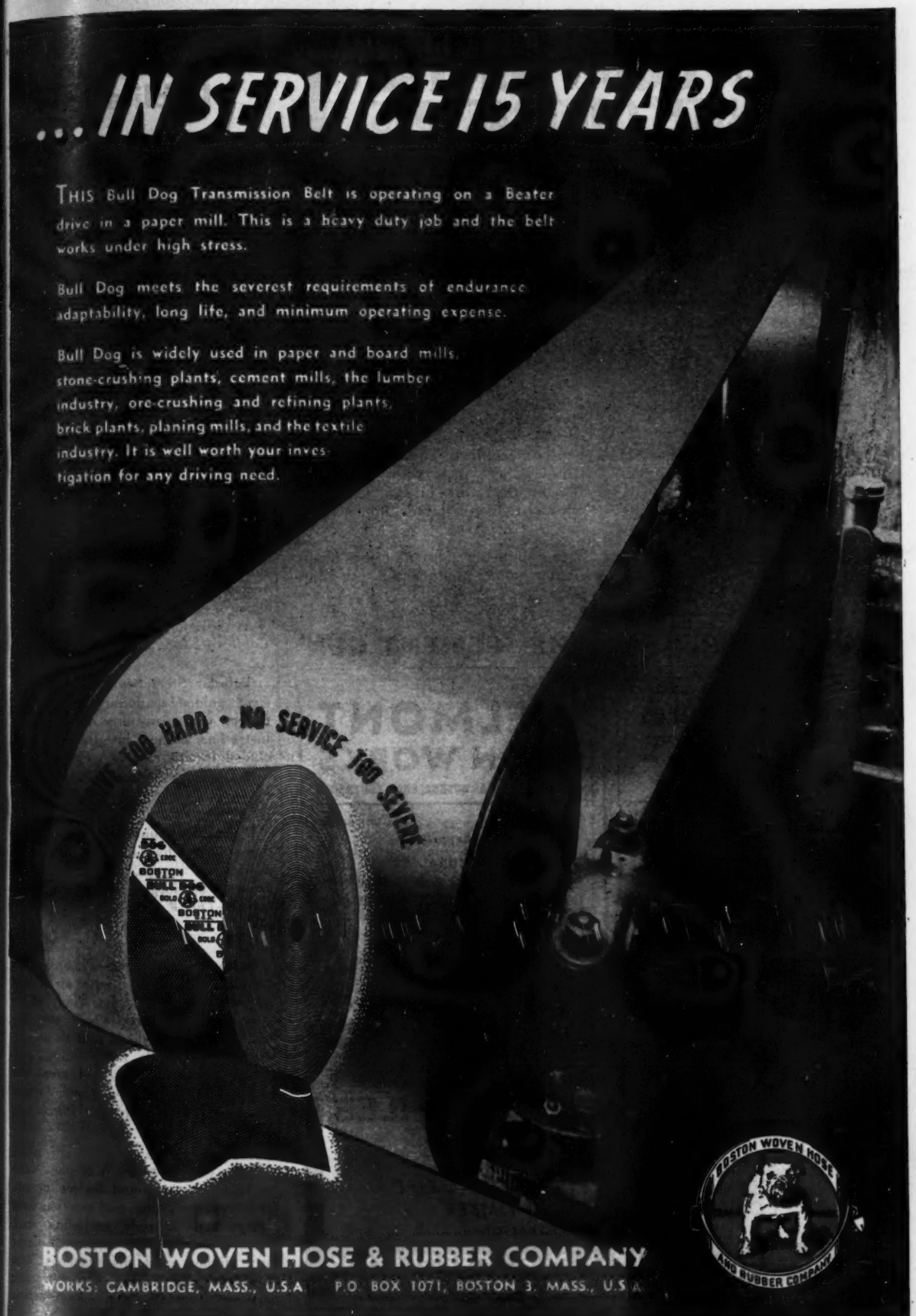

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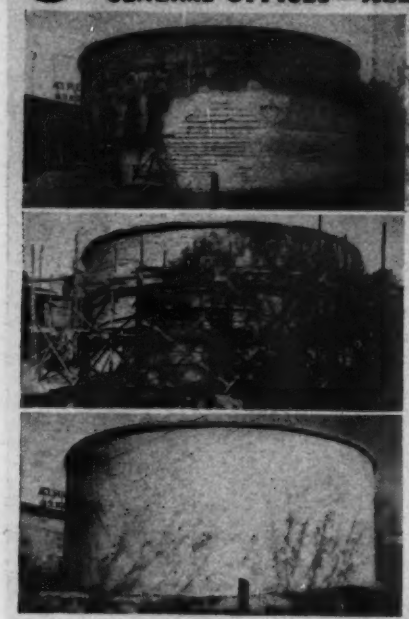

"GUNITED" 12 YRS. AGO —STILL SATISFACTORY

The upper photograph shows the badly disintegrated condition of a large old reinforced concrete tank at Alexandria, Minnesota,—note how the reinforcing steel was exposed by the elements. In the middle picture the old surface is being chipped and sand-blasted and the new reinforcing mesh being applied. At the bottom is the completed job, finished with white cement, after a coating of "GUNITE" had been applied. The interior of this tank was also lined with "GUNITE." We did this work in 1932 and now, after more than a decade, no deterioration is in evidence.

Our Bulletin 2200 describes many similar jobs and numerous other applications of "GUNITE." Ask us for a copy!

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Manufacturers' Publications

V-Belt Handbook—This 74-page handbook discusses the operating advantages of V-belts and their installation and care. It also includes tables on take-up allowances, service factors, a general belt selection table, horsepower ratings of Multi-V belts, corrections for arc of contact and exact speed of driven machine, standard groove dimensions for industrial V-belt sheaves, and sheave dimension tables.—*The B. F. Goodrich Co., Akron, Ohio.*

Welding Electrodes—In addition to suggestions on how to select the proper electrode for welding stainless steels, this booklet offers helpful information on welding procedures. It covers such subjects as carbide precipitation, distortion and warping, effect of heat on the base metal, butt joint design, preparation of joints, and welding dissimilar metals, as well as a chart showing recommended electrodes for different types of stainless steel.—*Page Steel and Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.*

Tubular Steel Scaffolding—Tubular steel welded scaffolding, ladders and towers, with many new designs and illustrations of new installations are included in this catalog.—*Universal Fittings and Scaffolding Co., Zelienople, Pa.*

Hydraulic Equipment—A bulletin that describes hydraulic equipment such as presses, pumps, and accumulators, as well as forged steel fittings and valves—*The Watson-Stillman Co., Roselle, N. J.*

Industrial Heating—This booklet describes a direct-fired warm air method of heating and illustrates many of the great war structures which are thus heated. The method is said to be particularly adaptable for buildings containing large, unobstructed areas difficult to heat.—*Dravo Corp., Dravo Building, 300 Penn Avenue, Pittsburgh, Pa.*

Form Engineering—A 65-page catalog lists many tools and devices for concrete form designing, and external form clamps and tie rods, including stud-locks for demountable forms, cantilever form aligners, and miscellaneous form hardware and clamp reconditioning parts.—*Williams Form Engineering Corp., Grand Rapids 7, Mich.*

REPUBLIC—THE PREFERRED PIPE FOR

When the heat from a fire actuates the heads in a sprinkling system, water must flow freely—OR ELSE the sprinkling system fails the purpose for which it was installed.

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This top-quality pipe acquires its clean inside and outside surfaces from the improved continuous weld process by which it is made.

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War Work has hampered us in supplying our Distributors with a complete line of LOWELL Wrenches. But V-Day will free us to serve once more our friends—the men in the heavy construction industry. In the meantime, ask your Distributor *which* LOWELL-WRENCHES he can ship you NOW.

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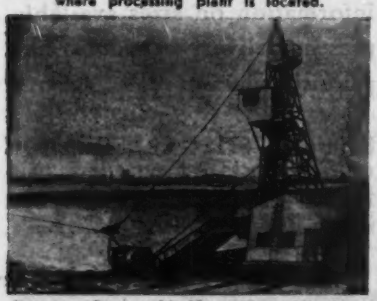

Sauerman Scraper Machine with mobile head tower equipped with loading ramp makes a long, wide cut and loads sticky material into cars at rate of 250 cu. yd. hourly.

LARGE savings in man-hours are effected by using Sauerman Drag Scrapers and Slackline Cableways in sand and gravel excavation, stockpiling and other material-handling jobs where the long operating range of these machines can be employed to advantage.

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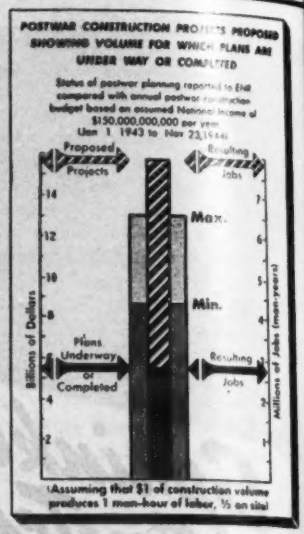
POSTWAR PROJECTS


POSTWAR CONSTRUCTION PROJECTS PROPOSED SHOWING VOLUME FOR WHICH PLANS ARE UNDER WAY OR COMPLETED
Status of postwar planning reported to ENR compared with annual postwar construction budget based on assumed National Income of $150,000,000,000 per year
Proposed Projects
Resulting Jobs
Max.
Min.
Billions of Dollars
Millions of Jobs (man-years)
Plans Underway or Completed
Resulting Jobs
†Assuming that $1 of construction volume produces 1 man-hour of labor, ½ on site

Projects proposed for postwar construction have been published in these columns since January, 1943, as they have been reported to Engineering News-Record.

Statistics based on these reports are used by the Committee on Postwar Construction of the American Society of Civil Engineers to measure the progress of plans for postwar projects.

The chart above shows, both in estimated dollar volume and in jobs or man-years of labor, how fast this reservoir of future work is filling up.

If you or your community are working on projects that have not yet been included in this "postwar reservoir," please send us an itemized list and description of them, including estimated cost and the names of the engineers who are at work on the plans. Then as you watch the arrows climb you will know that you and your community are contributing to the success of the NUMBER ONE JOB of preparing for peace.

Address your projects list to Manager Business News Department, Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

MINIMUM SIZE OF PROJECTS PUBLISHED

Public Works	$25,000
Industrial Buildings	40,000
All Other Buildings	150,000

WATER SUPPLY

PROPOSED WORK

Ill., Pontiac—Illinois Water Service Co., Champaign, elevated storage tank, $25,000; necessary tying in and strengthening distr sys., $25,000.

Ill., Vandalia—City, N. Atkinson, supt. Water Dpt., City Hall, surveys almost completed new water plant. $150,000.

Mass., Fitchburg—City, Dpt. P. Wks. City Hall, water supply sys., watermains replacing others, city-wide program. Over $15,000. CD 10/23—ENR 11/2.

★**Mich., Detroit**—Dpt. Water Supply, L. G. Lanhardt, supt. mgr., 735 Randolph St., 2 sedimentation tanks for city water supply. $750,000.

N. M., Alamogordo—City, City Hall, water reservoir. $50,000. Financing not provided.

N. M., Socorro—New Mexico School of Mines, Socorro, water sys. $19,000. Financing not provided.

N. M., Willard—City, City Hall, water supply sys. $16,000. Financing not provided.

★**Wash., Bremerton**—City, City Hall, replacing 12 mi. outmoded mains with c.i. pipe, laying addnl. 5 mi. c.i. pipe, constructing 13 mi. fence, etc. $500,000. C. C. Casad, City Hall, water supt.

PLANS UNDER WAY

Calif., Anaheim—City, City Hall, plans 25% completed 4- to 12-in. c.i. watermains, $85,200; plans two 500,000 gal. steel water storage tanks, $160,400. V. W. Hansen, 518 S. Los Angeles St., Light & Water Supt.

Calif., Modesto—City, 616 10 St., plans 10% completed two 500,000-gal. elevated water tanks, $120,000; watermains, $50,000. Financing not provided for. F. J. Reed, city engr.

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POSTWAR PROJECTS (Cont'd.)

Calif., Santa Monica—City, City Hall, plans 50% completed c.i. watermains, 10 m.g. reservoir, rein.-con. $350,000. Financing not provided for. H. B. Carter, Dpt. Engineering, City Hall, city engr.

★**Fla., Miami**—City, City Hall, preliminary plans completed water plant enlargement, $690,000; raw water supply, $200,000; 4 storage tanks, $300,000; high pressure mains, $140,000; recalcining plant, $150,000; miscellaneous repairs, $270,000. Funds available. C. S. Nichols, city engr. CD 11/5/43—ENR 11/11/43.

Fla., North Miami—Town, R. H. Dalrymple, acting mayor, City Hall, plans 30% completed enlarging water plant, $50,000. Financing not provided for.

Ill., Clinton—City, City Hall, deep well, $15,000; iron removal and water softening plant at existing water plant site. $25,000-$30,000. Warren & Van Praag, Standard Office Bldg., Decatur, consult. engrs.

Ill., Harrisburg — City, City Hall, plans 60% completed impounding reservoir and raw water line to city, $356,000, funds partially available; plans 30% completed laying addnl. watermains, $80,000, funds available. R. D. Brown, Box 15, consult. engr. CD 7/12—ENR 7/27.

Ill., Hillsboro—City, City Hall, plans completed watermain exten. $20,000. Financing not provided for. E. G. Hurst, Co. Hy. Bldg., city engr.

Ill., Litchfield—City, City Hall, plans completed 6 billion gal. impounding reservoir, ½ mi. northeast of existing lake. $350,000. Financing not provided for. E. G. Hurst, Co. Hy. Bldg., Hillsboro, consult. engr.

Ill., Livingston—City, City Hall, preliminary plans completed water sys. $125,000. E. G. Hurst, Co. Hy. Bldg., Hillsboro, consult. engr.

Ill., Palestine—Illinois Municipal Water Co., Robinson, plans 90% completed 1 m.g. concrete reservoir, $34,000; booster and repump. station, $25,000; pipeline from reservoir site into distr. sys., and addnl. mains for reinforcement and fortification, $50,000. W. J. Schneider, plant engr.

Ill., Wood River—City, City Hall, preliminary sketches water softening plant at existing water plant site. $50,000. P. Nifong, city engr.

Mass., Sharon—Town, plans 50% completed gravel pack well and main extens. $30,000. Land rights not cleared. Weston & Sampson, 14 Beacon St., Boston, consult. engrs. Bd. Water Comrs., engr.

Mich., Alpena—City, City Hall, plans 50% completed WW bldg., changing over from steam to electric, $34,000; replacing wood watermains and exten. present distr. sys., constructing 750,000 gal. elevated storage tank, $450,000. Shoecraft, Drury & McNamee, State Savings Bank Bldg., Ann Arbor, consult. engrs.

Mich., Iron Mountain—City, City Hall, plans 50% completed watermain extens. H. T. McNeely, 1505 W. Ludington St., engr. $45,500. CD 10/26—ENR 11/16.

Mich., Roscommon—Village, plans under way watermain exten. $15,000.

N. Y., Carmel—Carmel Water Dist. 3, Mahopac, Lake Secor water sys. $30,000. P. V. Ryan, Mahopac, consult. engr.

N. Y., Silver Springs—C. L. Husted, mayor, City Hall, plans completed reservoir and pipeline, $29,000. Financing not provided for. Wm. H. McFarland, 12 Elizabeth St., Port Dickinson, Binghamton, consult engr. CD 12/15—ENR 12/23.

PROJECTS CANCELLED.

★**Tex., Wichita Falls**—City, Geo. D. Fairtrace, mgr., City Hall, cancelled earthern, rein.-con., steel retention dam and spillway, municipal water supply. $2,500,000. Now going ahead. A. J. Gates, City Hall, Water Dpt. engr. CD 9/28—ENR 10/19.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

★**Ill., Vandalia**—City, N. Atkinson, supt. Water Dpt., City Hall, sewage collection and disposal sys., and disposal plant. $500,000.

Mass., Fitchburg—City, Dpt. P. Wks., City Hall, replacements, exten. sewer mains, various streets. Over $25,000.

Mich., Stockbridge—Village, sewerage sys. $22,000.

N. M., Las Cruces—City, City Hall, sanitary sewers. $95,000. Financing not provided for.

Ore., The Dalles—City, City Hall, sewage disposal sys. $100,000.

Tex., Brownsville—City, sanitary sewer imprvs., extens. $100,000.

Tex., Sherman—City, T. F. Aston, mayor, City Hall, sanitary sewage disposal plant. $70,000.

PLANS UNDER WAY

★**Calif., Alameda**—City, City Hall, reconstructing storm and sanitary sewerage lines; constructing intercepting sanitary sewerage line and lift stations in coordination with East Bay Disposal plan. $500,000. C. Froerer, City Hall, city engr.

Calif., Anaheim—City, City Hall, plans 50% completed 6, 8 and 10 in. vitr. sanitary sewers, brick manholes, $29,200; plans 60% completed 12 and 30 in. concrete storm drains, $29,300; plans treatment plants, $65,000. E. P. Hapgood, City Hall, city engr.

Calif., Big Bear Lake—Big Bear Lake Sanitation Dist., Big Bear Lake, plans completed sewers. $255,491. [illegible] funds available.

Calif., Loma Linda—Loma Linda Sanitary Dist., Loma Linda, plans under way sewers. $131,618. Financing not provided for.

Calif., Modesto—City, 616 10 St., plans 20% completed industrial sewage treatment plant, $300,000; sanitary sewage plant expans., $150,000; industrial interceptor lines, $40,000; sanitary sewer extens. and relief sewers, $50,000. Land rights not cleared and financing not provided for. P. J. Rossi, 616 10 St., city engr.

Calif., National City—City, City Hall, plans 30% completed 6- to 15-in. vitr. sanitary sewers, precast concrete M.H.'s & pumping plants. $400,000. Land rights not cleared and financing not provided for. C. B. Ireland, City Hall, city engr.

Calif., Pasadena—City, 100 N. Garfield Ave., plans 50% completed 5 new sanitary and 3 storm water sewers, $280,000. J. H. Allin, 100 N. Garfield Ave., Supt. Streets and city engr.

Calif., Quincy—Quincy Sanitary Dist., Quincy, plans 20% completed sanitary with treatment and pumping plant, $142,500. C. C. Kennedy, 605 Mission St., San Francisco, consult. engr.; sanitary septic tank, $133,000. Thomas, Macadaes & Whipple, Palo Alto, consult. engrs. Financing not provided for.

Calif., Redwood City—City, City Hall, sewage treatment plant, sewers, $366,500; city wide drainage, $85,000. Land rights not cleared and financing not provided for. R. J. Clarke, City Hall, acting city engr.

★**Calif., Riverside**—City, City Hall, plans completed trickling filter type sewage treatment plant, $450,000. Financing not provided for. Hedman-Ferguson & Carroll, Home Builders Bldg., Phoenix, Ariz., consult. engrs.; plans 80% completed main lines and collecting lines, $200,000. Land rights not cleared and financing not provided for. L. Nafsger, city engr.

★**Calif., San Francisco**—City and County San Francisco Co., City Hall, voted bonds Lake Merced sewerage sys., $3,500,000; Napoleon St. sewer, Jerrold to Selby, $10,000; Lower Islais Creek (Alemany Sewer Exten.), $250,000; Laguna St. Diversion (sanitary), $40,000; Richmond-Sunset treatment plant enlargement, $600,000; North Point treatment plant-lands, $1,400,000; Upper Army St., Sects. B & C, $500,000; La Playa-West Sunset-Sect. C, $350,000; Vicente Outfall-West Sunset-Sect. D, $300,000; 19th Street Sewer, $700,000; Lake St. Sewer, $1,300,000; Potrero Ave. sewer, 25 St. to Army, $250,000; 46 Ave. and Lincoln Sanitary Diversion, $35,000; Caselli Ave. sewer, Douglass to Market, $35,000; Army St. sewer, Connecticut to Mississippi, $25,000; Gutenberg Street Sewer exten., $30,000; 21 St., Third to Iowa, $45,000; 7 St. sewer exten. under S. P. tracks, $15,000; 29 St., Upper Army St. Dist., $100,000; Pine and Broderick Streets Sewer, $100,000; Commercial Street Dist. Sewers, $170,000; Jackson St. District Sewers, $450,000; Front and Green St. District Sewers, $170,000; Lower Market St. District Sewers, $580,000; 14th St. Valencia to Dolores, $80,000; Ingleside Dist. Sewer, Sect. C, $160,000; North Point Treatment plant-plans, $200,000; Islais Creek District Sewers, $500,000. J. J. Casey, City Hall, city engr. CD 3/18/43—ENR 3/25/43.

★**Calif., Santa Ana**—City, City Hall, reconstructing vitr. clay sanitary sewer outfall line, constructing storm drains, $724,000. Financing not provided for. H. M. Neighbour, City Hall, city engr.

Calif., Santa Barbara—City, City Hall, plans completed West Side storm drain, $230,000; Alameda Padro Serra Storm drain, $57,000; Rancheria St. interceptor sewer, $56,000; Mesa Trunk Line sanitary sewer, $52,000; alternate plan $35,000; Verde Vista storm drain, $26,000. Financing not provided for. C. W. Moore, city engr.

Calif., Santa Monica—City, City Hall, plans 95% completed interceptor for business section and construction section of main outfall. $425,000. Financing not provided for. H. B. Carter, City Hall, city engr.

★**Fla., Coral Gables**—City, G. N. Shaw, mgr., City Hall, plans 50% completed sanitary sewerage sys. $1,000,000. Financing not provided for. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.; plans 10% completed dry wells, covered ditches for storm drainage, $10,000; incinerator addns., another furnace, $15,000. Financing not provided for.

Fla., Hialeah—City, H. Milander, mayor, City Hall, preliminary plans 10% completed sanitary sewers, disposal plant. $120,000.

★**Fla., Miami**—City, City Hall, plans 15% completed sewage disposal plant or outfall sewer, $5,300,000; plans 90% completed sewers along Biscayne Bay and along side of Miami River, $2,000,000; plans 50% completed sanitary sewers in Allapattah and other sections; storm sewers in downtown dist., $900,000. Financing not provided for. C. S. Nichols, city engr. CD 11/5/43—ENR 11/11/43.

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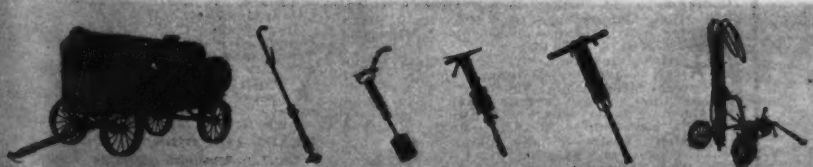

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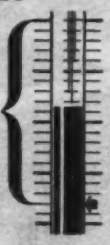

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POSTWAR PROJECTS (Cont'd.)

★**Fla., Miami Beach**—City, R. Renshaw, mgr., City Hall, plans 50% completed sanitary sewers, $178,000; storm drainage, $287,000; sanitary sewer force main, $98,000; sanitary sewer pump station, $15,000. Financing not provided for.

★**Fla., Miami Shores**—Village, C. L. McCall, mgr., preliminary plans 20% completed sanitary sewers, $500,000; incinerator, $20,000; preliminary plans 25% completed storm sewers, $100,000.

Fla., Surfside (br. Miami)—Village, preliminary plans 75% completed purchasing incinerator, $25,000. Financing not provided for; plans 25% completed 10 mi. sanitary sewer, 2 pump. stations, 2 mi. pressure outfall line, $286,410, storm sewers, $49,110. Legal obstacles to be overcome, financing not provided for. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.

Ill., Livingston—City, City Hall, preliminary plans completed sewerage sys. $125,000. E. G. Hurst, Co. Hy. Bldg., Hillsboro, consult. engr.

Ill., Oaklawn—City, City Hall, enlarging sewage disposal plant. $75,000. Edwin Hancock Eng. Co., 1509 W. Jackson St., Chicago, consult. engrs.

Ill., Rosiclare—City, City Hall, plans completed sanitary, storm, sewerage sys., $100,000; disposal plant in southern part of town, $30,000. Financing not provided for. Miller Eng. Co., Streator, consult. engr.

Ind., Decatur—City, City Hall, storm relief sewers, disposal plant. R. E. Ruup, City Hall, city engr. CD 7/31—ENR 8/10.

★**Ind., Hammond**—City, City Hall, 2 storm relief sewers, pump. plants. $4,000,000. Legal obstacles to be overcome and financing not provided for. A. D. Millard, City Hall, city engr.

Ind., Lafayette—City, City Hall, plans 90% completed combined sewer. $56,000. H. B. Overesch, City Hall, city engr. CD 7/19—ENR 7/27.

Ind., La Porte — City, Masonic Temple Bldg., plans 50% completed, clay or concrete storm sewer, $48,000; plans digestor and piping at sewage plant, $25,000. J. E. Hupp, Jr., Masonic Temple Bldg., city engr.

★**Ind., Mishawaka**—City, City Hall, plans under way treatment plant, interceptors and relief sewers, etc. $1,500,000. Land rights not cleared, legal obstacles to be overcome, and financing not provided for. J. L. Stevens, city engr. Charles W. Cole & Son, 220 West LaSalle St., South Bend, consult. engrs. CD 9/22—ENR 10/5.

Ind., Noblesville—City, City Hall, storm sewer in eastern part of city, $60,000; sewage disposal plant, $150,000. M. Davis, city engr.

Ind., Shelbyville—City, City Hall, plans 90% completed by R. J. Buck, archt. and consult. engr., Edinburg, sewage disposal plant. $150,000. C. R. Yater, Shelbyville, engr. CD 11/26—ENR 12/2.

★**Ia., Waterloo**—City, City Hall, plans 75% completed storm sewer separation. $2,200,000; plans 50% completed sanitary sewer and pump. station, $30,000. CD 6/9/43—ENR 6/17/43.

Kan., Topeka—City, Street Dpt., 215 E. 7 St., plans under way storm sewers in Strait and Belmont Sts. to Kansas River (3 sections), $96,397; 9 St., Oakley to Frasier Sts., $22,500; Kansas St., 6 to Quincy Sts., $19,588; Atwood St., 19 to 21 Sts., $10,230; Polk St., 2 to 5 Sts., $31,518; 2 and Polk Sts., 7 to Clay Sts., (3 sections), $98,651; 24 and Kansas Sts. to Butcher Creek, $11,545; Edgewood Park, $44,900; storm water lift station, City Park, $31,000; 3 pumps, City Park Station, $30,000; West Side intercepting sewer, pump. station, disposal plant, $30,000; East Side plant improvs., $42,000. Funds available. W. R. Baldry, city engr. CD 5/9—ENR 5/18.

Mich., Alpena—City, City Hall, plans 75% completed sewerage sys. exten., sewage treatment plant, $275,000. Shoecraft, Drury and McNamee, State Savings Bank Bldg., Ann Arbor, consult. engrs. CD 10/25—ENR 11/16.

★**Mich., Ann Arbor**—City, plans under way sewage treatment plant. Approx. $500,000. Shoecraft, Drury & McNamee, 306 State Savings Bank Bldg., consult. engrs. G. H. Sandenburgh, City Hall, city engr.

Mich., Iron Mountain—City, City Hall, surveys 80% completed sewer exten., $52,300; plans sewage treatment plant, a joint project between here and Kingsford village, $200,000. H. T. McNeely, 1505 W. Ludington St., engr. CD 10/26—ENR 11/16.

Mich., Ishpeming—City, City Hall, plans under way sewage disposal plant, $130,000; storm sewers, $250,000.

★**Mich., Jackson**—City, City Hall, plans 20% completed sewerage improvs., relief sewers, $2,000,000. Shoecraft, Drury and McNamee, State Savings Bank Bldg., Ann Arbor, consult. engrs. J. M. Biery, City Hall, city engr. CD 10/25—ENR 11/16.

Mich., Leslie—Village, plans under way, sewerage sys. $55,000.

Mich., Norway—City, City Hall, plans under way sewerage sys. $100,000.

Mich., Three Rivers—City, C. Conrad, mgr., City Hall, sewage disposal plant, $275,000; sanitary sewers, $31,825. J. Cowgill, city engr.

N. H., Laconia—City, Mayor's Office, City Hall, sewage disposal plant, $100,000+. Financing not provided for. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs.

N. Y., Brooklyn—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way sludge line, PW-112, $20,000; alterations, landscaping PW-152, $300,000, both at Coney Island Sewage Treatment Works. R. H. Gould, Div. Dir. Engrg.

★**N. Y., Brooklyn**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way Newtown Creek Sewage Treatment Works, PW-53, $10,000,000. R. H. Gould, Div. Dir. Engrg. CD 2/21—ENR 3/9.

★**N. Y., Mineola** — Comrs. Nassau County Court House, plans 40% completed county wide sewerage projects. $6,372,000. Greeley & Hansen, 299 Bway., New York, archts. Dpt. P. Wks., Nassau Co., engr. CD 3/9—ENR 3/23.

★**N. Y., New York**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way Hunts Point Sewage Treatment works, PW 56, plant, $9,000,000, Greeley & Hansen, 299 Bway., Zone 7, consulting engrs.; sewers, $3,220,000, R. G. Gould, Div. Dir. Engrg. CD 3/22/43—ENR 3/25/43.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans completed East Brooklyn Intercepting sewers, PW-102, $675,000. Financing not provided for. R. H. Gould, Div. Dir. Engrg.

N. Y., Penn Yan—Village, W. B. Manwick., Village Hall, plans 75% completed refuse incinerator. $28,000. T. J. Morrison, 273 Grand Ave., Rochester, Zone 9, consult. engr. CD 4/7—ENR 4/20.

N. Y., Port Chester—Village, Village Hall, plans under way sanitary imprvs., $177,000; plans 40% completed incinerator, $125,000. W. P. Raisch, 233 Fulton St., New York, consult. engr. F. I McGrath, 110 Wilson Ave., engr. CD 3/2, 4/7—ENR 3/23, 4/29.

★**N. Y., Rockaway**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way Rockaway Sewage Treatment Works, PW-55, plant, $1,480,000. Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs.; sewers, $940,000. R. H. Gould, Div. Dir. Engrg. CD 5/19/43—ENR 5/28/43.

★**N. Y., Rye**—City, Square House, Rye, plans 100% completed sanitary sewers, storm drains, retaining wall, pavements, curbs in 3 streets, $81,924; sanitary, storm sewers, drains, pavements, walks, curbs in 8 streets, $137,765. Land rights not cleared and financing not provided for; sanitary sewers, paving, curbing 10 streets in Cedar Oaks area, $84,007, sanitary sewers, storm drains, sewage pump. sta., paving 10 blocks Greenhaven Ave., $269,717. Financing not provided for; plans 95% completed storm drains, pavement in 11 streets, $84,800; plans 50% completed replacing storm drains, paving in 5 streets, $75,338; plans 10% completed storm drains and macadam paving streets in Colonial Park area, $20,158; plans sanitary sewers in Rockridge Rd., $33,180; sanitary sewers, storm drains, pavements in 9 streets, Hix Ave. and Harbor Terrace Area, $48,815; 3 streets, $49,000; sanitary sewers, storm drains, pavement and sidewalks for 9 streets in Milton Road Sect., $57,530. R. W. Murphy, Square House, Rye, city engr. CD 4/20—ENR 5/4.

N. Y., Salina—Salina Sewer Dist. 4, Salina, plans 95% completed sewers. $110,000. G. D. Holmes & W. S. Gere, 117 James St., Syracuse, Zone 2, consult. engrs. CD 4/7—ENR 4/20.

★**N. Y., Whitestone**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way Whitestone Intercepting Sewer, PW-108. $1,100,000. R. G. Gould, Dir. Div. Engrg.

N. Y., Wilson—Village, L. Shrader, clk., Village Hall, plans 10% completed remodeling sewage disposal plant, $30,000. Financing not provided for. L. H. Wendt, 23 Morrow Ave., Lockport, consult. engr. CD 4/7—ENR 4/20.

★**N. C., Charlotte**—City, City Hall, new or remodeled sewerage disposal plants, $750,000; sewers, $280,800. Funds available; storm sewers, $73,500. Financing not provided for. L. McC. Ross, City Hall, city engr. CD 2/18—ENR 3/9.

★**O., Cincinnati**—Bd. Comrs. Hamilton Co. Court House, plans under way storm and sanitary sewers. $3,500,000. Bond issue approved. H. Coates, Court House, co. engr.

Pa., Phila.—City, City Hall, plans 50% completed installing sump pumps, Broad St. Train Subway, CT-6. $210,000. G. Exley, dir. City Transit Dpt.

★**Wash., Tacoma**—City, City Hall, approved $3,000,000 bonds sewerage sys. imprvs. C. D. Forsbeck, City Hall, city engr. CD 6/24/43—ENR 7/1/43.

READY FOR BIDS.

Calif., Anaheim—Orange County Outfall Sewer, City Hall, Anaheim, plans completed reconstructing 3.6 mi. 30 in. vitr. Sect. 1, outfall sewer, brick manholes, near here. $130,000. Koebig & Koebig, 458 S. Spring St., Los Angeles, consult. engr. E. P. Hapgood, City Hall, engr.

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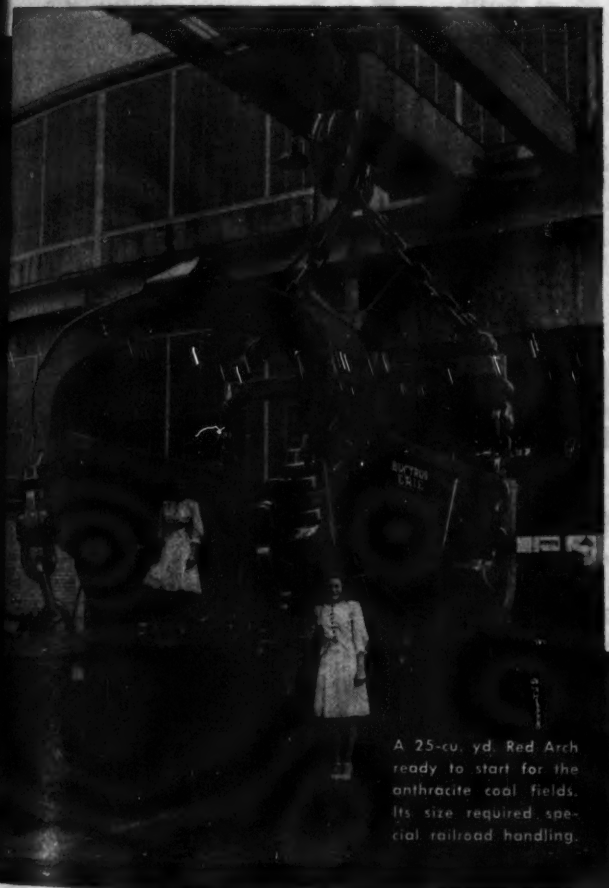

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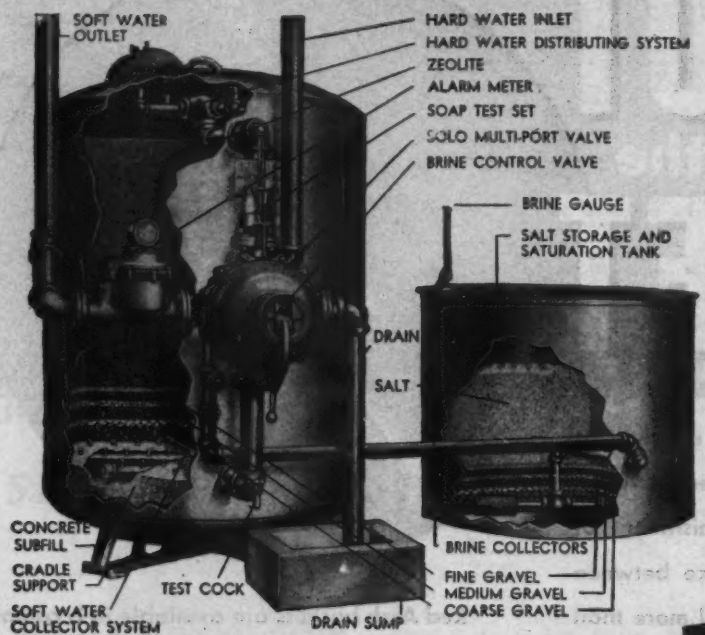

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POSTWAR PROJECTS (Cont'd)

Ill., Herrin—City, City Hall, P. Har... supt. Water & Sewage, plans comple... sewage disposal plant, near here. ... $250,000. G. H. Anderson, City Hall, city e... pleted incinerator in connection with sew... disposal plant. $25,000.

N. Y., Port Chester—Village, Village Ha... plans completed storm water drains for ... streets. $84,429. F. I. McGrath, 110 Wil... Ave., engr. CD 12/15—ENR 12/23.

BRIDGES

PROPOSED WORK

Calif., San Bernardino—San Bernardi... Co., San Bernardino, 3 bridges over San... Ana River. $300,000. Financing not pr... vided for.

Ill., Edwardsville—Madison Co. Hy. Dp... H. A. Kluge, supt. Edwardsville, gra... separation, I. T. S. R. R. SAR 6, $100,0... A & S, L. & M. N. Y. C. and St. L. SA... 9, $200,000.

Ill., Peoria—Peoria Co., E. J. Wand... sup. hys., County Bldg., plans bridg... $117,100.

Mont., Westfall (Mail Superior)—Mine... Co., J. McMillan, clk., Westfall, bridge o... Missoula River near here, $45,000.

PLANS UNDER WAY

Ala., Tuscaloosa—Tuscaloosa Co., surve... 25% completed bridge across North Riv... $30,000; surveys completed North Riv... Bridge, $25,000; Crippie Creek Brid... $20,000; plans Tyro Creek Bridge, $10,0... surveys 50% completed Sipsey River Brid... $25,000; Riley Bridge, $15,000. Funds ava... able; no surveys made bridge across Nor... River, $35,000. W. Finnell, co. engr.

★**Calif., Los Angeles**—City Bd. P. Wk... City Hall, new bridges and reconstructi... bridges over Tujunga Channel and L... Angeles River in San Fernando Vall... $1,270,000. L. Aldrich, City Hall, city en...

Calif., Modesto—City, 616 10 St., pla... 10% completed canal bridges, $30,000; L... Loma Bridge, $20,000. F. J. Rossi, 616 T... St., city engr.

Calif., Quincy—Plumas Co., Quincy, pla... 75% completed Hamilton Branch Brid... steel. $50,000. Financing not provided fo... D. R. Warren, 461 Market St., San Francis... Zone 5, consult. engr. A. J. Watson, c... survr.

★**Calif., Pasadena**—City, 100 N. Garfie... Ave., jointly with State of California, ... preliminary studies 2 concrete arch and ... girder bridges. $1,272,000. J. H. Alba, 1... N. Garfield Ave., city engr. and supt. street...

Calif., Portola—Plumas Co., Quincy, gra... separation. $60,000. Financing not pr... vided for. D. R. Warren, 461 Market S... San Francisco, Zone 5, consult. engr. A. ... Watson, co. surv.

Calif., Redwood City—City, City Ha... plans under way concrete bridges on Vall... Rd., Redwood Ave., Gordon, Hudson, Pu... Clinton, Sapphire, Topaz and Dupre Dr... $30,000. Financing not provided for. R. ... Clarke, City Hall, acting city engr.

Calif., Ventura—Ventura Co., Cour... House, rein.-con., timber bridges and via... ducts, Mupu Rd., $32,400, Guiberson Rd., ... $104,700, Lockwood-Ozena, $60,820, tota... length 1,850 ft. Land rights not cleare... and financing not provided for. R. L... Stump, Court House, co. surv.

Conn., Danbury—State Hy. Dpt., Wm. ... Cox, comr., Hartford, 3 span 151 ft. ste... I-Beam, concrete bridge, abutments an... piers, 40 ft. wide, Mill Plain over Route ... $143,000. L. G. Sumner, State Office Bldg., Hartford, engr.

★**Fla., Miami**—City, City Hall, preliminary ... plans 35% completed rebuilding Sout... Miami Ave. and West Flagler St. Bridge, ... $3,187,500. Financing not provided for. C... S. Nichols, City Hall, city engr. CD 11/1—ENR 11/11/43.

★**Fla., Miami**—Dade Co., Court House, ... Zone 32, preliminary plans 50% com... pleted constructing causeway with 2 bas... cule lift bridges to Elliott Key, highway ... from east end of Causeway to connect wit... road at Key Largo, imprv. Lacy St., $4,500,... 000; bridge over Baker's Overhaul Cut, ... $500,0000; plans completed replacing bridge ... across Tamiami Canal, South River Dr., ... $60,000. Financing not provided for. E. K... Rader, 1301 Court House, Zone 32, co. engr. CD 7/22/43—ENR 7/29/43.

Fla., Miami Beach—City, R. Renshaw, ... mgr., City Hall, plans 40% completed con... structing bridges and repairing structures, ... $183,000. Financing not provided for.

Ill., Hillsboro—Montgomery Co., Co. Bd. ... Bldg., Hillsboro, bridges, $200,000. E. C. ... Hurst, County Hy. Bldg., co. supt. hys.

Ill., Mount Carroll—Carroll Co., Mount ... Carroll, bridge, 3 creosoted pile abutments, ... concrete floor, $25,000. Illinois Div. Hys., ... Geo. F. Burch, Springfield, archt. S. C. ... Campbell, Mount Carroll, co. supt. hys.

Ill., Princeton—Bureau Co., Princeton, ... plans 30% completed 6 large rein.-con. box ... culverts and 6 about 550 lin. ft. concrete ... bridges or concrete and I-Beam. $100,000. ... Land rights 75% cleared and financing 50% ... provided for.

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POSTWAR PROJECTS (Cont'd.)

Kan., Topeka—City, Street Dpt., 215 E. 7 St., viaduct, 10 St. from Jefferson to Chestnut Sts. $300,000. Financing not provided for. W. R. Baldry, city engr.

Kan., Topeka—City, Street Dpt., 215 E. 7 St., plans under way bridges over Shunganunga Creek, 21 St. $30,000; Topeka St., $50,000. Funds available. W. R. Baldry, City Hall, city engr.

★**N. Y., Brooklyn**—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed New Stillwell Ave. Bridge to replace existing bridge over Coney Island Creek, PW-32. $860,700. Financing not provided for. S. Hardesty, 101 Park Ave., New York, Zone 17, engr. CD 10/20—ENR 11/2.

★**N. Y., Brooklyn**—Dpt. P. Wks., I. V. A. Huie, comr. P. Wks., Municipal Bldg., New York, Zone 7, plans under way New Vernon Ave. Bridge over Newtown Creek, PW-27. $2,875,000. R. H. Gould, Div. Dir. Engrg.

★**N. Y., Jamaica**—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, 2 movable bridges over north and south channels of Jamaica Bay, PW-132. $1,211,000. Shortridge Hardesty, 101 Park Ave., New York, Zone 17, engr.

★**N. Y., Mineola**—Comrs. Nassau Co., Mineola, plans under way Saddle Rock Bridge over Udall Pond, $350,000, preliminary plans completed bridge on East Rockaway Rd., $50,000, A. B. Cohen, 1 Madison Ave., New York, consult. engr.; preliminary plans 10% completed Long Beach Bridge, $700,000; preliminary plans completed Park Ave. Bridge over Mill River, $18,000. Dpt. P. Wks., Nassau Co., engr. CD 7/6—ENR 7/27.

★**N. Y., New York**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way imprvs., approaches to Queensboro Bridge, PW-107. $500,000. R. H. Gould, Div. Dir. Engrg. CD 9/28—ENR 10/5, under Roads.

★**N. Y., New York**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way reconstructing, imprv. bridges, PW-8. $581,000. R. H. Gould, Div. Dir. Engrg.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed New Unionport Bridge to replace bridge over Westchester Creek, PW-3. $1,720,000. Financing not provided for. O. H. Ammann, 111 8th Ave., Zone 11, engr.

★**N. Y., New York**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans completed Eastern Blvd., Bridge over Bronx River, PW-2, substructure, $428,000, Moran, Proctor, Freeman & Meuser, 420 Lexington Ave., Zone 17, consult. engr.; superstructure, $872,000, R. H. Gould, Div. Dir. Engrg. Financing not provided for. CD 1/25/43—ENR 1/28/43.

Pa., McKeesport—City, c/o Mary A. Fargo, clk., City Hall, grade crossing elimination. DeLeuw, Cather & Co., 20 N. Wacker Dr., Chicago, Ill., consult. engrs. L. F. Savage, City Hall, city engr.

Pa., Phila.—City, City Hall, plans 75% completed new bridge over Cobbs Creek at 61 St., Proj. F 25, $195,514.

★**Virginia**—Elizabeth River Tunnel Comm., Richmond, bridge or tunnel between Norfolk and Portsmouth, $8,500,000. Parson, Brinckerhoff, Hogan & Macdonald, 142 Maiden Lane, New York 7, N. Y., and J. E. Greiner Co., 1201 St. Paul St., Baltimore, Md., engrs.

READY FOR BIDS.

Ill., Peoria—Peoria Co., E. J. Wendell, supt. Hys., Peoria, plans completed bridge, $35,000.

Ill., Toulon—Stark Co., Highway Bldg., plans completed 3,600 sq. ft. floor, I-Beam and triple 10x10x60 ft. box culvert. $30,000. D. H. Sharkey, Highway Bldg., engr.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr. P. Wks., Zone 7, plans completed protection plates on Queensboro Bridge over playground, $77,400. R. H. Gould, dir. Div. Engrg.

STREETS AND ROADS

PROPOSED WORK

★**Ill., Edwardsville**—Madison Co. Hy. Dpt., H. A. Kluge, supt., Edwardsville, concrete paving 1.6 mi., Sect. 69-MFT, SAR 4-A, Moro-Bethalto, $80,000; 4.4 mi., Sect. 73-15d, SAR 35, Collinsville-Granite City, $275,000; 1.6 mi. Collinsville-Granite City, $103,000; 0.7 mi. Sect. 79-15d, SAR 35, Nameoki-Alt. U. S. 67, $35,000; 1.8 mi. East Alton-Upper Alton, $127,000; 3.3 mi. Sect. SAR 4-B, Highland and Grantfork, $168,000; concrete paving, grade separation 2 mi. Upper Alton-Proposed U. S. 67, $148,000; bituminous paving 1 mi. Sect. SAR 16, Route 100 Clifton, $32,000; 1.4 mi. Ninth St. Road, Woodriver, $40,000; grading, bridges, oil stabilization 1 mi. Sect. 74-MFT, SAR 3-B, U. S. 66-Pruit, $23,000; 2.5 mi. Sect. 77-MFT, SAR 3, Prairietown-Staunton, $112,000; 5 mi. SAR 3, Prairietown-Staunton, $164,000; 4.2 mi. SAR 1, Troy-St. Clair Co. line, $161,000; 6.8 mi. SAR 6, Marine-Grantfork, $142,000; 0.9 mi. SAR 36, U. S. 67-Jersey Co. line, $14,000; 2 mi. SAR 5 and 5B, Fosterburg to Macoupin Co. line, $42,000; 4.2 mi. SAR 4-B, Grantfork-Route 1[illegible] $88,000; 5.7 mi. SAR 4-B, Route 140-Sta Douglas, $122,000; 4 mi. Highland-St. Ro $120,000; grading, bridging 0.5 mi. Sec 75-MFT, SAR 15, Fruit Road north Marine, $25,000; 0.2 mi. Sect. 76-MFT SA 8-A, St. Jacob-St. Clair Co. line, $7,000; 6 mi. SAR 8-A, St. Jacob-St. Clair Co. lin $9,000; 1 mi. Sect. 78-MFT, SAR 1-C Prairietown-Worden, $57,000; 1 mi. SAR 1 southwest of Troy, $76,000; 6 mi. SAR 1 and 5A, Route 113, Fosterburg, $123,00 7.5 mi. SAR 5-A, Fosterburg-Godfre $157,000.

★**Mass., Fitchburg**—City, Dpt. P. Wks City Hall, paving various streets, con structing northern by-pass from Summer Lunenburg Sts., relocating River St., con structing westerly by-pass from Mt. Elia to Rollstone Rds. and east from Wood worth Ave. to South St., incl. exten. Electr Ave. $500,000.

N. M., Clayton—City, City Hall, stree surfacing, $74,000. Financing not provided

Tex., Brownsville—City, paving. $100,00

PLANS UNDER WAY

Ala., Gadsden—Bd. Revenue Etowah Co. Gadsden, plans 6% completed bituminous surfacing 100 mi. Altoona to intersect with Attalla-Walnut Grove Rd., $78,000. Alabama State Hy. Dpt., Montgomery, consult. engrs. R. B. Burleson, Box 757, engr.

★**Ala., Tuscaloosa**—Tuscaloosa Co., plans light bituminous paving Hargrove Rd. from point at end of present paving, 3 mi. east of city limits of Tuscaloosa, 8 mi. in southeasterly direction to Mt. Zion Church, $100,000; Watermelon Rd. from east city limits of Northport 9 mi. in northeasterly direction to Cedar Tree Church, $135,000; surveys completed Moores Bridge and Windham Springs Rd. from Marcumville on U. S. 43, 22 mi. north of Tuscaloosa 7 mi. easterly to Windham Springs on U. S. 69, $120,000; surveys 25% completed Whitson Rd. from point 20 mi. north of Tuscaloosa on U. S. 43, 13 mi. in northerly direction to Fayette Co. line 3 mi. south of Berry, $170,000; plans New Lexington and Sterling Road from point on Whitson Rd. 28 mi. north of Tuscaloosa and north of North River 3 mi. in an easterly direction to Sterling, $30,000; Upper Columbus Rd. from point 7 mi. west of Tuscaloosa on U. S. 82, 7 mi. in northwesterly direction to old Daniel Higher place, $165,000; surveys completed light bituminous paving Lock 17 Road from point on U. S. 11, 18 mi. northeast of Tuscaloosa 7 mi. in northerly direction to large coal mining community near Kellerman, $100,000; survey 50% completed Moore's Bridge Rd. from point 5 mi. north of Tuscaloosa on U. S. 43, 24 mi. in northwesterly direction to Fayette Co. line 10 mi. south of Fayette, $260,000; survey completed Romulus Rd. from point on U. S. 82, 7 mi. west of Tuscaloosa 11 mi. southwesterly direction to J. R. Partrich store, $165,000; Tuscaloosa-Aliceville Rd. from point on U. S. 11, 11 mi. southwest of Tuscaloosa via J. R. Partrich store to Greene Co. line near Jena, $150,000. Funds available. W. Finnell, co. engr.

★**Ariz., Florence**—Pinal Co. Hy. Dpt., Florence, widening, draining, stabilization, oil cake and seal coat 35.8 mi. county section line main roads, farm to market, $1,200,000; widening, draining, realignment and stabilization 55 mi. main county roads serving mining areas, $216,000. L. O. Fisel, Florence co. engr.

★**Calif., Alameda**—City, City Hall, plans 25% completed reconstructing bituminous pavement 12 mi. city streets; bituminous concrete paving 0.4 mi. streets. $750,000. C. Froerer, City Hall, city engr.

Calif., Anaheim—City, City Hall, plans 40% completed asphalt surface treatment, $48,500; asphaltic concrete paving, $32,300; concrete curb, etc., $18,200. E. P. Hapgood, City Hall, engr.

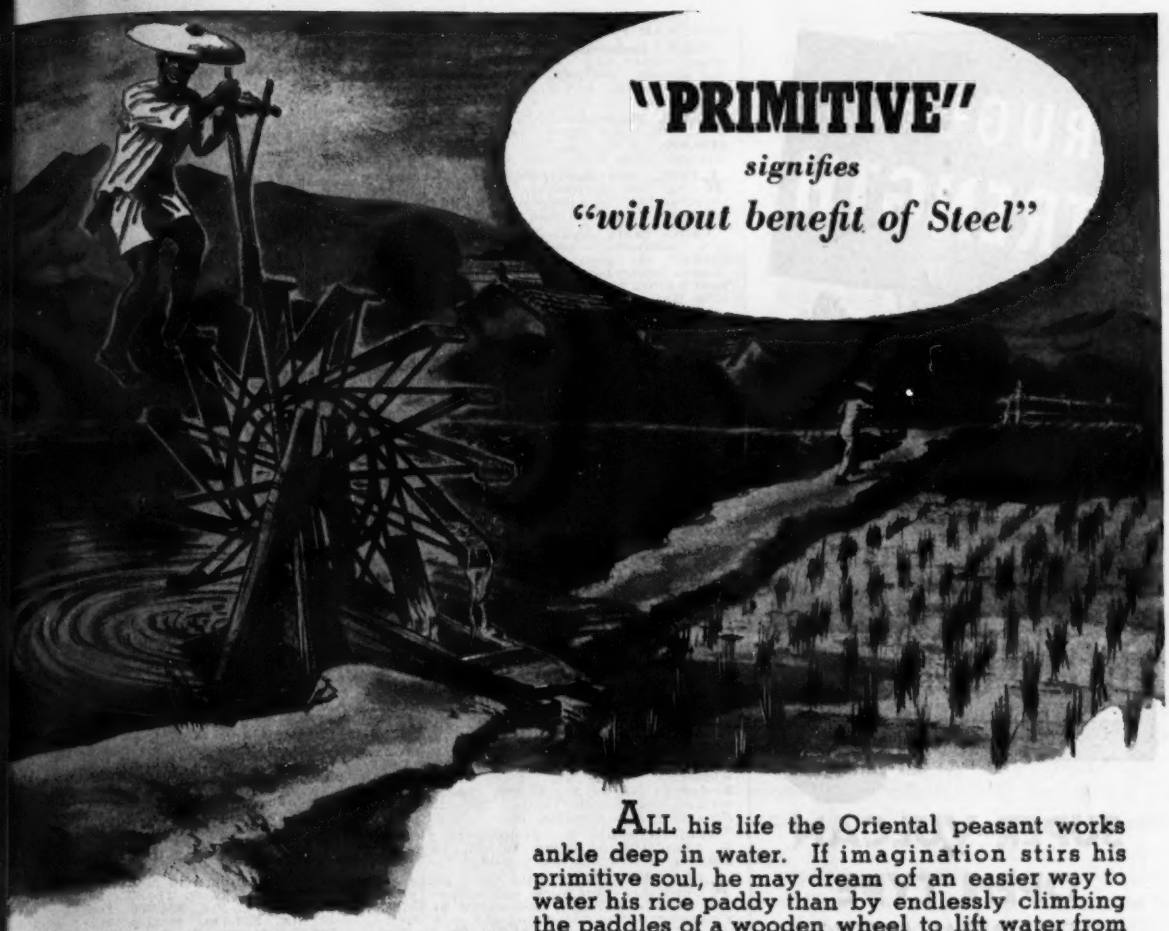
Calif., Modesto—City, 616 10 St., plans 10% completed maintenance, $200,000, funds available; state hy. widening 3 projects, $130,000, financing not provided for. F. J. Rossi, 616 10 St., city engr.

Calif., National City—City, City Hall, plans under way grading, oiling, bituminous concrete surfacing streets. $36,000. 75% financing provided for. C. B. Ireland, City Hall, city engr.

★**Calif., Pasadena**—City, 100 N. Garfield Ave., plans 15% completed widening, concrete curbing, guttering, sidewalks and bituminous concrete paving 1 street; straightening bituminous concrete repaving 1 street; widening, concrete curbing, guttering, walks, bituminous concrete paving 1 streets; exten., concrete curbing, guttering, walk, bituminous concrete paving 1 street, $1,302,000. Land rights not cleared. J. H. Allin, 100 N. Garfield Ave., supt. Streets and city engr.

★**Calif., Pasadena**—City, 100 N. Garfield Ave., miscellaneous bituminous macadam street maintenance and repair. $200,000. J. H. Allin, 100 N. Garfield Ave., Supt. Streets and city engr.

★**Calif., Quincy**—Plumas Co., Quincy, plans 50% completed 6 mi. Quincy-Spanish Ranch Rd., $194,300, land rights not cleared and financing not provided for; plans 75% completed Eastside Lake Almanor Rd., $161,750. Financing not provided for. A. J. Watson, co. surv. D. R. Warren, 461 San Francisco, Zone 5, consult. engr.



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POSTWAR PROJECTS (Cont'd.)

Calif., Redwood City — City, City Hall, plans under way constructing, reconstructing streets. $52,000. Financing not provided for. R. J. Clarke, City Hall, acting city engr.

Calif., Riverside—City, City Hall, plans 50% completed imprv. various city streets, $100,000. Financing not provided for. L. Nafzger, City Hall, engr.

★**Calif., San Bernardino**—San Bernardino Co., San Bernardino, plans under way constructing, reconstructing highways. $1,000,000. Financing not provided for.

Calif., Santa Ana—City, City Hall, plans 10% completed asphalt resurfacing and asphalt pavement, reconstructing portland cement sidewalk and curb. $402,400. Financing not provided for. H. M. Neighbour, City Hall, city engr.

★**Calif., Santa Monica**—City, City Hall, plans 60% completed street widenings, openings, vehicular and pedestrian grade separation structures, street and alley paving, lighting sys., reforestation. $5,625,000. Financing not provided for. H. B. Howard, City Hall, city engr.

★**Calif., Ventura**—Ventura Co., Court House, making surveys, reconstructing, widening, resurfacing Loma Vista Rd., $32,200; Pleasant Valley Rd., $154,227; Hueneme Rd., $79,746; South Mountain Rd., $64,000; Las Posas Rd. $65,117; Creek Rd., $45,665; Piru Canyon Rd., $42,700; Arnelli Rd., $21,985; Etting Rd., $60,866; Rice Rd., $32,895; Gulberson Rd., $59,485; Lockwood-Ozena, $344,000. Land rights not cleared and financing not provided for. R. L. Stump, Court House, co. surv.

Fla., Coral Gables—City, G. N. Shaw, mgr., City Hall, preliminary plans completed replacing 133,290 sq. ft. concrete sidewalks, $27,000; reoiling, sanding 1,047,000 sq. yd. streets, $104,723; rebuilding 30 mi. streets, incl. 4 in. new rock, rebonding, oil and sand wearing surface, $150,000; preliminary plans 10% completed grassing, top soiling and landscaping parkways, $25,000. Financing not provided for. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.

Fla., El Portal (br. Miami)—Village, A. E. Moore, mayor, City Hall, preliminary plans 10% completed rebuilding 3 mi. streets and reoiling, sanding 4 mi. road, $21,000; widening NE 2 Ave. from Little River Bridge to NE 91 St., $5,000; concrete sidewalks and street lights, NE 2nd Ave. Financing not provided for.

Fla., Hialeah—City, preliminary plans 10% completed replacing 10 mi. sidewalks, $50,000. Financing not provided for.

★**Fla., Miami**—City, City Hall, plans 25% completed lime rock and oiling 140 mi. city streets $954,000, sidewalks $1,697,000, Financing not provided for; pea rock surfacing 450 mi. city streets $1,039,500, asphaltic concrete retread city streets $2,310,000. C. S. Nichols, City Hall, city engr. CD 11/5/43—ENR 11/11/43.

★**Fla., Miami**—Dade Co., Court House, Zone 32, plans completed Rickenbacker Causeway to Virginia Key and Key Biscayne, $2,700,000; preliminary plans 50% completed beautification Ingraham Highway, $150,000, Financing not provided for; preliminary plans 75% completed rebuilding lime rock, asphaltic oil and sand resurfacing 200 mi. roads, $600,000; reoiling, sanding 250 mi. roads, $250,000. E. M. Rader, 1301 Court House, Zone 32, co. engr. CD 7/22/43—ENR 7/29/43.

★**Fla., Miami Beach**—City, C. Renshaw, mgr., City Hall, plans 60% completed resurfacing, widening pavements, $254,000; paving streets, $394,000; paving streets, $1,159,000. Financing not provided for.

Fla., Miami Shores—Village, C. L. McCall, mgr., City Hall, preliminary plans 50% completed 6 in. compacted base with asphaltic oil surfacing 2.63 mi. streets, $33,000; 4 in. compacted lime rock with oil and sand wearing surfacing 17.31 mi. alleys, $36,620. preliminary plans completed asphalt on rock resurfacing 21.67 mi. streets, $71,500. Financing not provided for.

Fla., Miami Springs—City, City Hall, preliminary plans 20% completed rebonding, oiling and sanding on lime rock paving 20 mi. streets, $100,000.

Fla., North Miami—Town, R. H. Dalrymple, acting mayor, City Hall, preliminary plans 10% completed reoiling, sanding streets. $25,000. Financing not provided for.

Fla., Opa Locka—City, City Hall, preliminary plans 25% completed 7.9 mi. oil and sand on 5 in. compacted rock surfacing, $45,000; rebonding, reoiling and resanding 8.9 mi. streets, $35,000. Financing not provided for.

Fla., Surfside (br. Miami)—Village, plans completed rebuilding 69,000 lin. ft. streets, $69,000. Financing not provided for. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.

★**Ill., Collinsville**—City, City Hall, plans under way concrete and asphaltic pavement. $900,000. E. H. Hurst, Co. Hy. Bldg., Hillsboro, engr.

Ill., Eldorado—City, City Hall, plans 10% completed concrete, resurfacing streets. $40,000. Funds available. R. D. Brown, Box 15, Harrisburg, consult. engr. CD 9/7—ENR 9/21.

Ill., Harrisburg—City, City Hall, plans [illegible] completed, concrete and bituminous concrete resurfacing streets, $40,000; [illegible] imprvs., $20,000. Funds available. R. [illegible] Brown, Box 15, consult. engr. CD 7/12—ENR 8/10.

Ill., Hillsboro—Montomery Co., Co. Hy. Bldg., plans crushed stone road surfacing $100,000; plans under way crushed stone road surfacing, $40,000. E. G. Hurst, Co. Hy. Bldg., engr.

Ill., Litchfield—City, City Hall, asphaltic paving, concrete curbs and gutters, $100,000; concrete paving, $200,000. E. G. Hurst, Co. Hy. Bldg., Hillsboro, consult. engr.

Ill., Mount Carroll—Carroll Co., Mount Carroll, grading, culverts, bridges, gravel or stone surfacing 4.3 mi. $55,000. C. Willett, Dixon, consult. engr. S. C. Campbell, Mount Carroll, co. supt. hys.

★**Ill., Peoria**—Peoria Co., E. J. Wendel, supt. Hys., County Bldg., plans concrete roads, $315,000, financing not provided for; plans roads, $376,000; plans 25% completed roads, $190,700; plans 50% completed roads, $409,500.

Ill., Princeton—Bureau Co., Princeton, plans 40% completed bituminous retread 13 mi., $180,000; oil graveling 10 mi. $80,000; gravel surfacing 20 mi., $160,000. Land rights 40% cleared and financing 40% provided for.

Ill., Toulon—Stark Co., Highway Bldg., plans 90% completed low cost bituminous surfacing 70 mi. $300,000. D. H. Sharkey, Highway Bldg., engr.

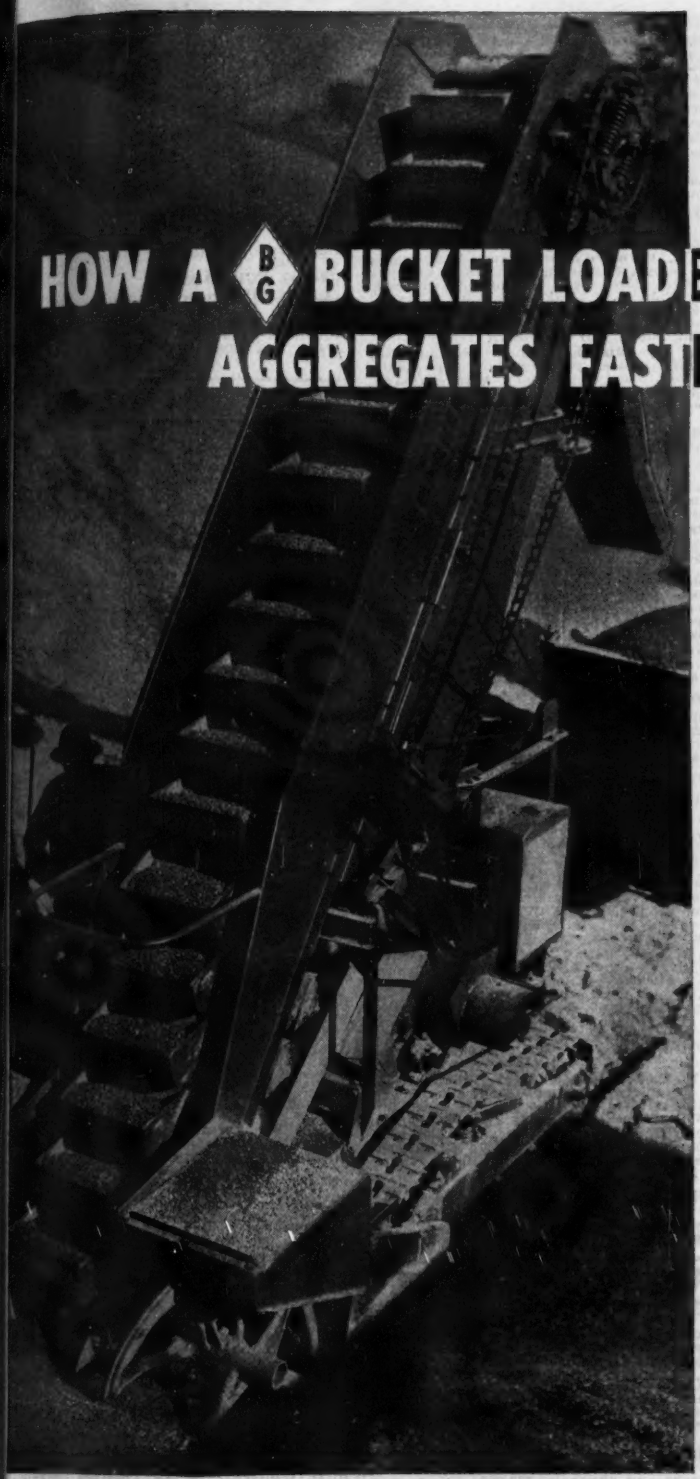
Ind., Kokomo—City, City Hall, plans 50% completed bituminous, concrete streets and sidewalks. $100,000. Financing not provided for. L. A. Warden, City Hall, city engr. CD 7/13—ENR 8/10.

Ind., LaPorte — City, Masonic Temple Bldg., plans completed resurfacing old street asphalt streets. $100,000. Financing not provided for. J. E. Hupp, Jr., Masonic Temple Bldg., city engr.

★**Kan., Topeka**—City, Street Dpt., 215 E. 7 St., plans under way, widening Sardou St., Emmett to Poplar Sts., $10,200; Sardou St., Poplar to Oak Sts., $10,200; Sardou St., Oakland to Strait Sts., $6,800; imprv. Locust St., 4 to 10 Sts., $28,530; widening Huntoon St., Buchanan to Mulvane Sts., $30,000; Huntoon St., Buchanan to Western Sts., $18,000; Huntoon St., Western to Topeka Sts., $28,000; Huntoon St., Mulvane to MacVicar Sts., $41,000; Huntoon St., MacVicar to Oakley Sts., $48,000; Sward St., Branner to Twine Sts., $45,699; 17 St., Kansas to Topeka Sts., $19,020; 17 St., Topeka to Central Parks, $31,700; 17 St., Central Park to Washburn Sts., $31,700; 17 St., Washburn to MacVicar Sts., $38,040; Topeka St., 27 to 21 Sts., $52,500; Topeka St., 21 to 17 Sts., $66,600; Topeka St., 17 to 15 Sts., $32,500; Monroe St., 5 to 6 Sts., $10,870; Monroe St., 6 to 7 Sts., $11,249; Monroe St., 8 to 9 Sts., $11,429; Monroe St., 9 to 10 Sts., $13,610; paving 21 St. Buchanan to Topeka Sts., $45,006; surfacing MacVicar St., 6 to Cross Sts., $16,300; Poplar St., Sardou to disposal plant, $10,610; Waite St., Drive to Walker Sts., $10,360; MacVicar St., 17 to 21 Sts., $17,468; Munson St., Clay to Washburn Sts., $22,800; Walker and Hawthorne Sts., Waite to Drive Sts., $10,429; 24, 25 and 26 Sts., Fillmore to Western Sts., $10,008. Funds available. W. R. Baldry, city engr.

Mich., Alma—City, City Hall, plans 10% completed imprv. 5 streets. $203,120. P. H. Beaurais, City Hall, engr. CD 10/25—ENR 11/16.

★**Mich., Detroit**—Dpt. P. Wks., City Hall, plans under way concrete curbing, grading, asphalt on concrete paving 764 ft. Albany St., Lantz to Outer Dr., $11,460; 1,310 ft. Ashton Rd., Belton Ave. to Joy Rd., $25,950; 2,540 ft. Asbury Park, Fullerton Ave. to Schoolcraft, $38,100; 2,825 ft. Barrett Ave., Harper to Promenade, $42,375; 814 ft. Binder Ave., Lantz to Outer Dr., $12,210; 1,100 ft. Duprey, Morang to 359 ft. north of Casino, $16,500; 1,753 ft. Faust Ave., Kendall to Lyndon Ave., $26,370; 603 ft. Hamburg Ave., Greiner to Park Grove, $9,045; 673 ft. Harlow Ave., Clairta Ave. to 7 Mile Rd., $10,080; 662 ft. Hubbell Ave., Clarita Ave. to 7 Mile Rd., $9,930; 640 ft., Ilene Ave., Curtis to Pickford Ave., $9,630; 743 ft. Kirkwood Ave., Lonyo to Trenton Ave., $11,145; 1,098 ft., Laing Ave., 948 ft. north of Casino to Moross Ave., $16,470; 1,317 ft. Lappin Ave., Crusade to Redmond Ave., $19,755; 1,373 ft. Longacre, West Chicago to Orangelawn Ave., $19,095; 272 ft. McLean Ave., Gallagher to Klinger Ave., $4,080; 2,233 ft. Montrose Ave., Plymouth to Capital Ave., $33,495; 1,819 ft. Nottingham Ave., Grayton Rd. to Morang Ave., $27,285; 670 ft. Pinehurst Ave., Pilgrim to Puritan Ave., $10,050; 590 ft. Reno Ave. 7 Mile Rd. to Eastwood Ave., $8,850; 781 ft. Rosemont Ave., Clarita to 7 Mile Rd., $11,715; 1,791 ft. Somerset Ave., Grayton Rd., to Morang Ave., $26,865; 1,589 ft. Strathmoor Ave., Plymouth Rd. to Capital, $23,835; 895 ft. Strathmoor Ave., Vassar St. to St. Martins, $13,425; 2,497 ft. Sussex Ave., Tireman Ave. to Joy Rd., $37,455; 1,040 ft. Waring Ave. Northampton to Pennsylvania R.R. $16,200; 1,770 ft. Washburn Ave. Outer Dr. to 7 Mile Rd., $36,550; 1,988 ft. Whitcomb Ave., Pickford Ave. to 7 Mile Rd., $29,820; 864 ft. Woodmont Ave., Warren to Majestic Aves., $12,960. G. R. Thomson, City Hall, city engr.



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POSTWAR PROJECTS (Cont'd.)

★**Mich., Grand Rapids**—City, major thoroughfares through city relieving traffic congestion, $3,402,000; various streets and other street work, $2,314,500. Chas. Darling, City Hall, city engr.

Mich., Grand Rapids—City, City Hall, various alley imprvs. $497,183. Chas. Darling, city engr.

Mich., Iron Mountain—City, City Hall, surveys 40% completed imprv. streets. $314,000. H. T. McNeely, 1505 West Ludington St., engr. CD 10/25—ENR 11/16.

Mich., Three Rivers—City, C. Conrad, mgr., City Hall, paving various streets. $44,000. J. Cowgill, city engr.

N. Y., Carmel—Town, Town Hall, plans 70% completed town highway imprvs., $200,000; plans 10% completed sidewalk construction in Mahopac and Carmel, $37,200. Land rights not cleared, and financing not provided for. P. V. Ryan, Mahopac, consult. engr. CD 1/7—ENR 1/27.

★**N. Y., Mineola**—Comrs. Nassau Co., Court House, plans under way reconstructing roads and county wide drainage. $3,933,000. Dpt. P. Wks., Nassau Co., engr. CD 5/24—ENR 6/1.

N. Y., Riverhead—Town, plans 75% completed sidewalk project. $100,000. Financing not provided for. D. R. Young, Osborne Ave., consult. engr. CD 4/7—ENR 4/20.

N. Y., Rye—City, Square House, Rye, macadam pavements and gutters in 7 streets, $61,228. R. W. Murphy, Square House, city engr. CD 4/30—ENR 5/4.

★**Pa., Phila.**—City, City Hall, plans 25% completed realigning, resurfacing, paving park drives, new footwalks, Fairmount Park, Proj. Fp-48, $125,000; Proj. Fp-49, $120,000; Proj. Fp.-50, $100,000; Proj. Fp-51, $105,000; Proj. Fp-52, $110,000; Proj. Fp-53, $115,000; Proj. Fp-54, $125,000; Proj. Fp-55 $115,000; Proj. Fp-56, $115,000; Proj. Fp-57, $110,000; Proj. Fp-58, $89,004.

★**Wash., Tacoma**—City, City Hall, approved $500,000 bonds, streets and bridges. C. D. Forsbeck, City Hall, city engr.

READY FOR BIDS.

Calif., San Bernardino—San Bernardino Co., San Bernardino, plans completed imprv. repairing, resurfacing highways. $200,000. Funds available.

Ill., Gilman—City, A. Mulder, mayor, plans completed new sidewalks. $50,000. T. Cullins, Watseka, engr.

Ill., Hillsboro—Montgomery Co., Co. Hy. Bldg., plans completed crushed stone road surfacing, $80,071. E. G. Hurst, Co. Hy. Bldg., engr.

Ill., Mount Carroll—Carroll Co., Mount Carroll, plans completed grading, culverts and bridges and gravel or stone surfacing 6.4 mi. $75,000. C. K. Willett, Dixon, consult. engr. S. C. Campbell, Mount Carroll, co. supt. hys.

Ill., Peoria—Peoria Co., E. J. Wendell, supt. Hys., County Bldg., plans completed roads. $400,000. Funds available.

Ill., Peru—City, City Hall, plans completed 5 blocks concrete paving, concrete curb and gutter. Over $25,000.

N. M., Santa Fe—City, City Hall, plans completed street imprvs. $100,000. Funds available. CD 5/4—ENR 5/18.

N. Y., Port Chester—Village, Village Hall, plans completed curbing, repairing reconstructing streets. $70,200. F. I. McGrath, 110 Willett Ave., engr. CD 3/2—ENR 3/23.

★**Tex., Houston**—Harris Co., Court House, plans completed road work. $2,250,000. Bonds voted. H. Zapp, Court House, engr. CD 11/2—ENR 10/19.

PROJECTS CANCELLED.

N. Y., Somers—Town Clerk, Town Hall, cancelled highway imprvs. $100,000. CD 3/2—ENR 3/23.

EARTHWORK, WATERWAYS

PROPOSED WORK

★**Calif., San Bernardino**—San Bernardino Co., San Bernardino, 60 flood control projects. $13,542,422.

PLANS UNDER WAY

Calif., Modesto—City, 616 10 St., river development, $100,000; dam reconstruction, $15,000. Financing not provided for. F. J. Rossi, 616 10 St., city engr.

Calif., Redwood City—City, City Hall, plans under way drainage and flood control for creeks and channels, $33,000. Financing not provided for. R. J. Clarke, City Hall, acting city engr.

Calif., Santa Ana—City, City Hall, concrete walls and floor in flood channel. $160,000. Financing not provided for. H. M. Neighbour, City Hall, city engr.

★**Calif., Santa Monica**—City, City Hall, plans completed rock mound breakwater, repairing existing structure, enlarging present mound and exten. length. $1,760,000. Financing not provided for. H. B. Carter, City Hall, city engr.

Fla., Miami—Dade Co., Court House, Zone 32, plans 50% completed cleaning rivers and canals. $75,000. Financing not provided for. E. M. Rader, 1301 Court House, Zone 32, co. engr.

Fla., Miami Beach—City, C. Renshaw, mgr., City Hall, plans 50% completed seawalls and bulkheads. $325,000. Financing not provided for.

Fla., Surfside (br. Miami)—Village, plans 80% completed constructing concrete seawall along bay shore. $99,000. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.

Ill., Steger—City, City Hall, E. Smith, mayor, plans 70% completed drainage ditch running through town for flood control, $15,000. McCoy & Mulford, 16 St. and Chicago Rd., Chicago Heights, consult. engrs.

N. Y., Mineola—Comrs. Nassau Co., Court House, plans 10% completed dredging, $50,000. Dpt. P. Wks., Nassau Co., engr. CD 5/24—ENR 6/1.

READY FOR BIDS.

★**Tex., Houston**—Harris Co., c/o Judge, Court House, plans completed, drainage throughout 23 watersheds, $9,000,000. Bonds voted. H. Zapp, Court House, engr. CD 10/11, 11/2—ENR 11/2.

PUBLIC BUILDINGS

PROPOSED WORK

Calif., Modesto—City, 616 10 St., administration bldg. and jail. $200,000. Financing not provided for.

★**Calif., San Bernardino**—San Bernardino Co., San Bernardino, court house adds. $902,000. Financing not provided for.

Calif., San Bernardino—San Bernardino Co., San Bernardino, hospital ward bldg., $144,000; nurses' home, $70,000; psychopathic hospital, $5,000; hospital heating plant, $55,000; county bldgs., $105,000. Financing not provided for.

★**Calif., San Francisco**—City and San Francisco Co., City Hall, voted $1,250,000 bonds, juvenile detention home.

Ill., Carlyle—City, T. Murphy, supt. Water Dpt., City Hall, 500 hp. steam boiler, $25,000; 1,500 kw. steam turbine, $80,000, to be installed at present plant.

Ill., Hillsboro—City, City Hall, community center. $150,000.

†**Ill., Rock Island**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., post office.

★**La., Baton Rouge**—East Baton Rouge Housing Auth., E. Mason Ave., Monte Sano, Baton Rouge, 101 housing units, $750,000.

Me., Calais—City, E. A. Woodman, mayor, City Hall, concrete, brick high school, $200,000. Financing not provided for.

Mich., St. Joseph—Bd. Educ., E. B. Holden, supt., St. Joseph, brick, steel, concrete school, $150,000. H. G. Crow, city mgr.

N. M., Albuquerque—University of New Mexico, Albuquerque, boys' dormitory, $250,000; girls' dormitory, $181,000. Financing not provided for.

N. M., Las Cruces—City, City Hall, hospital. $150,000. Financing not provided.

N. M., Las Vegas—New Mexico Highlands University, Las Vegas, business education bldg., $109,000; home economics bldg., $124,000. Financing not provided for.

★**N. M., Portales**—Eastern New Mexico College, Portales, science bldg., $280,000; library, $200,000; girls' dormitory, $85,000; boys' dormitory, $47,000; auditorium, $153,000. Financing not provided for.

N. M., Silver City—New Mexico State Teachers College, Silver City, girls' dormitory, $96,000; boys' dormitory, $74,000; dining hall, $93,000; science bldg., $60,000. Financing not provided for.

O., Bexley—Bd. Educ., 326 S. Cassingham Rd., N. G. Fawcett, supt., approved bond issue school bldgs. $310,000. CD 10/3—ENR 10/19.

★**O., Cincinnati**—Bd. Comrs. Hamilton Co. Court House and Cincinnati Public Library, J. A. Green, pres. Bd. Trustees, 629 Vine St., approved bond issue library. $2,000,000. CD 7/19—ENR 7/27.

★**O., Cincinnati**—City, W. R. Kellogg, mgr., Municipal Bldg., approved bond issue new bldg. replacing McMicken Hall $1,000,000; women's dormitory, $350,000, both on campus of University of Cincinnati. R. H. Walters, pres. Bd. Trustees University of Cincinnati.

★**O., Cincinnati**—City, W. R. Kellogg, mgr., Municipal Bldg., approved bond issue R.O.T.C. Armory and field house on campus of University of Cincinnati. $650,000. R. W. Walters, pres. Bd. Trustees University of Cincinnati.

★**O., Cincinnati**—City Bd. Educ., 216 E. Ninth St., C. V. Courter, supt. Schools, approved bond issue, school bldgs. $12,000,000.

★**O., Troy**—Bd. Comrs., Miami County, Troy, Dettner Hospital, near here, $1,000,000. Funds available.

O., Wilmington—Bd. Comrs., Clinton Co., Wilmington, hospital. $300,000.

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POSTWAR PROJECTS (Cont'd.)

Okla., Oklahoma City—State, war memorial bldg., on Capitol Grounds. $300,000. Financing not provided for.

★**Tex., Amarillo**—Amarillo Public Schools, Amarillo, Senior-High School unit, $150,000; grade and high school, $150,000; school units, $500,000.

Tex., Athens—City, S. R. LeMay, school supt., City Hall, Junior High School annex and gymnasium. $175,000.

Tex., Brownsville—City, City Hall, municipal bldg. $150,000.

Tex., Bryan—Bryan Pub. School Bd., City Hall, school. $150,000.

Tex., Dallas—Dallas Bd. Educ., Akard and Royal Sts., public school, $250,000; grade school, $200,000.

★**Tex., Highland Park (Dallas)**—Highland Park Public Schools, H. L. Gable, supt., 3510 Normandy, school, $200,000, site purchased; Senior High school unit, $150,000; Junior High School unit, $150,000.

★**Tex., Houston**—Houston Independent School Dist., 1609 Washington St., voted $7,500,000 bonds, school bldgs., imprvs. CD 10/11—ENR 10/19.

Tex., Longview—Longview Pub. School Bd., Longview, ward school, $150,000; gym., $100,000.

Tex., Lufkin—Lufkin Bd. Educ., Lufkin, Junior High School, $275,000; 2 school units, $150,000.

Tex., Smithville—Smithville Pub. School Bd., repairing, altering some conversion existing schools. $200,000.

★**Wash., Tacoma**—School Bd., City Hall, voted $2,000,000 bonds bldgs. CD 9/20—ENR 10/5.

PLANS UNDER WAY

★**Calif., Berkeley**—Bd. Regents of University of California, R. G. Sproul, pres., Berkeley campus, plans by H. A. Thomsen, Jr., 315 Montgomery St., San Francisco, Forest Products Laboratory on Gill Tract, San Pablo Ave., $500,000. CD 8/24—ENR 9/7.

★**Calif., Davis**—Bd. Regents of University of California, R. G. Sproul, pres., Berkeley campus, plans by D. P. Smith, 53 Sutter St., San Francisco, poultry bldg., $250,000; plans by J. C. Funk, 51 Columbus Ave., San Francisco, student health bldg., $150,000; plans by H. A. Thomsen, Jr., 315 Montgomery St., San Francisco, soils and irrigation bld., $300,000. CD 8/24—ENR 9/7.

★**Fla., Miami**—City, City Hall, plans 60% completed library and administration bldg., $850,000; plans completed hospital, N.W. 10 Ave. and 28 St., $900,000. Financing not provided for. C. S. Nichols, City Hall, city engr. CD 11/5/42—ENR 11/11/42.

★**Fla., Miami**—Comrs. Dade Co., Court House, Zone 32, preliminary plans 10% completed auditorium. $1,000,000. E. M. Rader, 1301 Court House, Zone 32, co. engr. CD 7/22—ENR 7/29/43.

★**Fla., Miami**—Miami Housing Auth., Miami, plans 25% completed slum clearance N.W. 7 Ave. and 65 Sts., $1,000,347; N.W. 14 St. and 2nd Ave., $1,549,002. Land rights not cleared and financing not provided for. C. S. Nichols, City Hall, city engr. CD 11/5/42—ENR 11/11/42.

Ill., Edwardsville — Madison Co., H. A. Kluge, supt. Hys., Edwardsville, plans completed highway garage, $75,000; plans County Tuberculosis Sanitarium, $100,000. Financing not provided for.

★**Ill., Hillsboro**—Montgomery Co., County Bldg., sketches by E. G. Hurst of Hurst-Rosche, architectural engrs., Co. Hy. Bldg., court house. $1,000,000.

Ill., Litchfield—City, City Hall, preliminary sketches by E. G. Hurst, of Hurst-Rosche, architectural engrs., Co. Hy. Bldg., Hillsboro, city hall. $150,000.

Ill., Peru—City, City Hall, plans 10% completed by L. Gerdung, Ottawa., 2 story, stone city bldg., concrete fdn. $150,000.

Ill., Rock Island—T. Ellis, comr., P. Wks., City Hall, rebuilding 6 fire stations. Over $150,000. W. J. Gallagher, city engr.

★**Ind., Hammond**—Hammond City School, 5935 Hohman Ave., plans 90% completed by L. C. Benard, 7341 Forest Ave., concrete, steel school, $1,850,000. Land rights not cleared and financing not provided for. L. Beecroft, 5217 Hohman Ave., consult. engr. A. D. Millard, city engr. CD 9/5—ENR 9/21.

Ind., Noblesville—City, City Hall, high school. $250,000. M. Davis, city engr.

Kan., Topeka—City, Administration Dpt., 215 E. 7 St., library. $412,000. Land rights not cleared and financing not provided for. W. R. Baldry, city engr.

Kan., Topeka—City, Water Dpt., 215 E. 7 St., plans under way Westboro Main, $20,000; chemical storage, $100,000; wells, north of river, $35,000; meter removals, $100,000. Funds available. W. R. Baldry, city engr.

Kan., Topeka—City, Administration Dpt., 215 E. 7 St., National Guard armory, $150,420. Financing not provided for. W. R. Baldry, city engr.

La., Lafayette—Police Jury of Lafayette Parish, Lafayette, plans by A. Hays Town, Louisiana National Bank Bldg., Baton Rouge, war memorial auditorium, 1,500 seating capacity. $285,000, incl. site. Bonds voted. CD 10/20—ENR 11/2.

Mass., Lexington—Town, Fire Dpt., Town Hall, sketches by E. L. Morgan, 20 Robbins Rd., concrete brick, steel fire station, Massachusetts and Locust Aves. Over $150,000.

Mass., Lexington—Town, Library Bd., 1374 Massachusetts Ave., plans by Kilham Hopkins & Greeley, 125 Newbury St., Boston, brick, stone Gary Memorial Library addn., Massachusetts Ave. $150,000.

★**Mich., Ann Arbor**—Washtenaw Co., Ann Arbor, plans under way brick, stone, steel, concrete county bldg. $500,000.

Mich., Charlotte—City, Bd. Educ., plans under way 2 story, bsmnt., brick, steel, concrete school. $336,000.

★**Mich., Detroit**—Library Comn., Library Bldg., Woodward Ave., 2 wing, brick, steel, concrete, stone addn. to main library bldg. $3,235,000. G. R. Thompson, City Hall, city engr.

Mich., Grand Ledge—City, plans by W. S. Holmes Co., 2300 Olds Tower Bldg., Lansing, school. $160,000. CD 11/9.

Mich., Jackson—City, City Hall, plans 20% completed by H. R. Craf, 308 Reynolds Bldg., police station, hospital addn., and nurses' home. $297,500. CD 10/23—ENR 11/2.

Mich., Lake City—Missaukee County, Lake City, plans completed by F. D. Madison, Royal Oak, 2 story, bsmnt., brick, steel, stone, rein.-con. county bldg. $166,390. Financing not provided.

Mich., Livonia (Mail Plymouth)—School Dist. of Livonia Twp., Livonia, plans under way 2 story, bsmnt., brick, steel, stone, rein.-con. school. $400,000.

Mich., Manistee—Manistee Co., Manistee, plans under way brick, steel, concrete school. $225,000.

Mich., Muskegon—Muskegon Co., Muskegon, plans under way brick, steel, stone, rein.-con. county bldg. $226,800.

★**Mich., Royal Oak**—City, plans by F. P. Madison, Royal Oak, Junior High School, Senior High School addn., auditoriums to grade schools. $1,220,000.

★**Mo., Webster Groves (St. Louis 19, P. O.)**—School Dist. of Webster Groves, Bd. Educ., F. L. Wright, pres., and L. A. Steger, supt., 42 Selma Ave., plans by Wm. B. Ittner, Inc., 403 Bd. Education Bldg., 911 Locust St., St. Louis, Zone 1, 1,600 spectator auditorium-gymnasium with cafeteria on Bradford Ave., $285,000; high school athletic field, bleachers, shops, etc., Plymouth Ave., $100,000; new Douglas School bldg., $230,000; Goodall School addn., $75,000; Bristol School alterations, imprvs., $17,500. $700,000 bond election Dec. 5 for same. CD 11/1—ENR 11/16.

★**N. H., Laconia**—City, R. B. Eddy, supt. Schools, plans by Hudson & Ingram, 9 Buell St., Hanover, brick, steel Junior High School and gymnasium, $250,000; 2 story, bsmnt., brick, steel school, $300,000; brick steel school, $200,000, site not selected.

N. Y., Brooklyn—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 1, plans completed 76th Precinct Police Station, Proj. PO-43, for Police Dpt., 140 Centre St., New York, Zone 13. $174,000. Financing not provided for. R. G. Gould, Div. Dir. Engrs.

★**N. Y., Brooklyn**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way Brooklyn Terminal Market, Proj. M-35, for Dpt. Markets, 127 Centre St., New York, Zone 13. $1,091,000. R. H. Gould, Div. Dir. Engrs.

★**N. Y., Brooklyn**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York Zone 7, plans completed Coney Island Hospital, O.P.D., Proj. HO-13, for Dpt. Hospitals, 125 Worth St., New York, Zone 7. $526,000. Financing not provided for. R. H. Gould, Div. Dir. Engrs. CD 2/16—ENR 3/14.

★**N. Y., Brooklyn**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way laboratory and morgue, HO-102, $485,950; power plant tunnel HO-130, $135,000, both at Kings County Hospital, for Dpt. Hospitals, 125 Worth St., New York, Zone 7. R. H. Gould, Div. Dir. Engrs. CD 1/21—ENR 2/10.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed by M. W. Del Gaudio, 545 5th Ave., New York, Zone 17, 85th Precinct Station House, PS-30, for Police Dpt., 240 Centre St., New York, Zone 13. $194,700. Financing not provided for. CD 10/15—ENR 11/2.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Koch & Wagner, 32 Court St., Zone 2, Brownsville Sub-Station B, HL-9, for Dpt. Health, 125 Worth St., New York, Zone 13, $110,000.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, plans by Koch & Wagner, 32 Court St., Zone 2, Gravesend Sub-Station B, HL-22, for Dpt. Health, 125 Worth St., New York, Zone 13. $110,000. CD 10/15—ENR 11/2.

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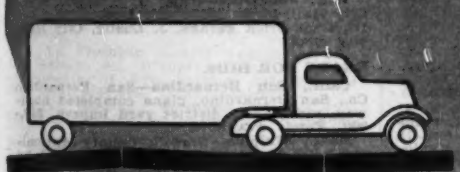

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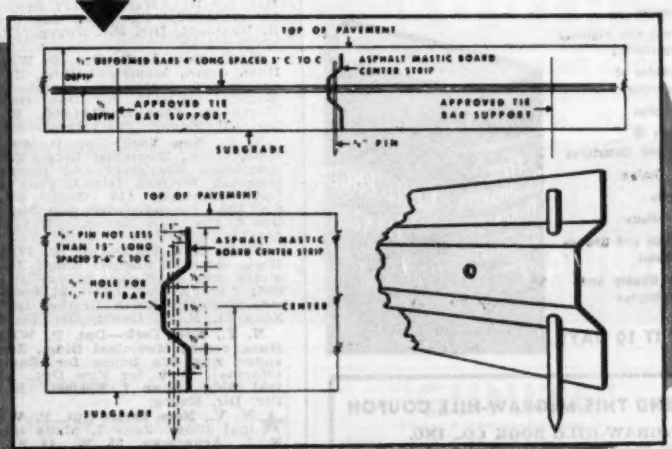
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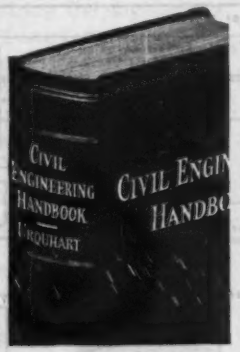

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POSTWAR PROJECTS (Cont'd.)

N. Y., Brooklyn—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York. Zone 7, plans completed Brownsville Health Sub-Station A, HL-8, for Dpt. Health, 125 Worth St., New York, Zone 13. $51,200. Financing not provided for. R. H. Gould, Div. Dir. Engrg. CD 2/10—ENR 2/24.

★**N. Y., Brooklyn**—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr. plans under way O.P.D., HO-18, $809,833; plans completed reconstruction, Imprvs., HO-99, $135,700. Financing not provided for, both at Cumberland Hospital, North Portland Ave., Brooklyn, Zone 1, for Dpt. Hospitals, 125 Worth St., New York, Zone 13, R. H. Gould, Div. Dir. Engrg.

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7 plans by A. Mertin, 101 Park Ave., New York, Zone 17, 66th Precinct Station House, PO-5, for Police Dpt., 240 Centre St., New York, Zone 13. CD 1/27—ENR 2/10.

N. Y., Flushing—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr., Zone 7, plans under way garage for Dists. 59, 61 and 62, Proj. S-6, for Dpt. Sanitation, 125 Worth St., New York, Zone 7. $417,000. R. H. Gould, Div. Dir. Engrg.

N. Y., Jamaica—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans completed garage for Dist. 64, 158 St. and Liberty Ave., for Dpt. Sanitation, 125 Worth St., New York, Zone 7. $450,000. Financing not provided for. R. H. Gould, Div. Dir. Engrg.

N. Y., Jamaica—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed Jamaica Health Center and Boro Office, Proj. HL-2, for Dpt. Health, 125 Worth St., New York, Zone 7, $400,000. Financing not provided for. R. H. Gould, Div. Dir. Engrg.

★**N. Y., New York**—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans completed Florence Nightingale Hospital, Proj. HO-37, $2,226,800; new O.P.D. and altering existing O.P.D., HO-12, $472,000 and pathological laboratory and admitting bldg., HO-8, $44,182, both at Lincoln Hospital; outpatient bldg. addn., at Morrisania Hospital, Proj. HO-14, $319,000, for Dpt. Hospitals, 125 Worth St., Zone 13. Financing not provided for. R. H. Gould, Div. Dir. Engrg.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr., Zone 7, plans completed Harlem Welfare Center, Proj. WL-1, for Dpt. Welfare, 902 Bway., Zone 10. $475,000. Financing not provided for. R. H. Gould, Div. Dir. Engrg.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., I. V. A. Huie, comr., Zone 7, plans under way reconstructing Tombs into Fire College and Training School, Proj. F-91, for Fire Dpt., 1133 Municipal Bldg., Zone 7. $165,000. R. H. Gould, Div. Dir. Engrg. CD 1/29/43—ENR 2/4/43.

N. Y., New York—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans completed Fulton Fish Market, Unit 3, Proj. M-7, for Dpt. Markets, 127 Centre St., Zone 13. $450,000. Financing not provided for. R. H. Gould, Div. Dir. Engrg. CD 1/29/43—ENR 2/4/43.

N. Y., New York—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way garage and storehouse, Lincoln Hospital, HO-136, for Dpt. Hospitals, 125 Worth St., Zone 7. $111,000. R. H. Gould, Div. Dir. Engrg. CD 1/25/43—ENR 1/28/43.

N. Y., New York—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans completed laboratory and morgue at City Hospital, Welfare Island, Proj. HO-17, for Dpt. Hospitals, 125 Worth St., Zone 7. $142,425. Financing not provided for. R. H. Gould, Div. Dir. Engrg. CD 1/29/43—ENR 2/4/43.

N. Y., New York—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way replacing boilers HO-133, $92,000; T.B. Pavilion, HO-7, $113,000, at Riverside Hospital, North Brother Island, Bronx, Zone 54, R. H. Gould, Div. Dir. Engrg.

N. Y., New York—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., Zone 7, plans under way fire house for Engine Co. 78 (Marine), F-90, for Fire Dpt., 1133 Municipal Bldg., Zone 7, $50,000. R. H. Gould, Div. Dir. Engrg.

★**N. Y., New York**—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed by F. L. Ackerman, 25 W. 44 St., Zone 13, staff house, C-13, $95,000; classification bldg., C-21, $425,000; psychopathic bldg., C-22, $315,000, all at Rikers Island, for Dpt. Correction, 300 Centre St., Zone 13. Financing not provided for. CD 8/5/43—ENR 8/12/43.

N. Y., Port Chester—Village, Village Hall, plans 25% completed by H. F. Mertz, 145 Horton Ave., office bldg., $168,000; plans 5% completed firehouse, $75,000. F. L. McCrath, 110 Willett Ave., engr.

O., Briggsdale—Franklin Twp. Bd. Educ., plans by Walker, Norwick & Templin, American Bldg., Dayton, school and addn., to Skidmore School, $278,000. Bond issue approved.

★**O., Columbus**—Ohio State University, Dr. H. L. Bevis, pres., N. High St., plans under way by H. Dwight Smith, university archt., Brown Hall, library addn., $860,000; music and fine arts bldg., $850,000; auditorium, 3,500 to 5,000 seating capacity, $830,000; physics bldg., $750,000; science bldg., $750,000; engineering experiment station on campus, $750,000; veterinary college bldgs., $750,000; hospital addn., $750,000; power plant addn., $730,000; Aspo Hall addn., $600,000; Brown Hall addn., $500,000; chemical engineering bldg., $500,000; Hamilton Hall medical college, $300,000; field house for indoor athletic events, $500,000; agriculture laboratory, $450,000; dentistry and university health service bldg., $450,000; Campbell Hall addn., $250,000; central service and warehouse bldg., $400,000; women's physical education bldg., $400,000; men's physical education bldg., $200,000; radio and speech unit, $150,000; botany and zoology bldg. addn., $350,000; fireproofing Oxley Hall, women's dormitory $150,000; incinerator plant, $50,000. Financing not provided for.

O., Forestville—American Twp. Bd. Educ., Forestville, plans by Walker, Norwick & Templin, American Bldg., Dayton, high school addn. $350,000.

★**O., Lima**—City Bd. Educ., 701 Citizens Bldg., plans by T. D. McLaughlin, 600 Dominion Bldg., 1 story, bsmnt., 100x150 ft. vocational education bldg., Kibby and Pierce Sts. $500,000. CD 7/31—ENR 8/10.

O., Lockland—City Bd. Educ., W. Ferrer St., plans by Grunkemeyer & Sullivan, 2717 Eastern Ave., Cincinnati, high school addn. $350,000. Financing not provided.

★**Okla., Oklahoma City**—Oklahoma State Fair Assn., Oklahoma City, addnl. bldgs., etc., incl. roads, utilities at exposition grounds, $1,000,000. Financing not provided for. C. G. Baker, c/o owner, engr.

★**Pa., Phila.**—City, City Hall, plans 10% completed by J. Roletter, city archt., bldg. addns. and repair shops, Proj. WM 1, 2, $41,435; new repair shop, Proj. WM-3, $3,000,000, for Bureau Mech. Equip.

★**R. I., Providence**—Housing Auth. of City of Providence, D. Barry, chn., 4 Weybossett St., plans by M. Untersee, 4 Weybossett St., housing on Lester Booth, A and Dodge Sts., Codding Court, $631,000; Admiral Terrace Housing, $1,270,000. Financing not provided for. Hubbard, Rickerd & Blakeley, 275 Orange St., New Haven, consult. engrs.

Tex., Brownsville—Brownsville Ind. School Dist., Brownsville, plans 50% completed by C. L. Ellis & Co., Merchants National Bank Bldg., 118 x 145 ft., brick, concrete, hollow tile recreational center and gym., incl. facilities for boxing, wrestling, basketball, stage, etc. $150,000. CD 2/10—ENR 2/17, under Pub.

Tex., San Antonio—City, G. B. Mauermann, mayor, City Hall, produce distr. market. $300,000. T. Coghill, City Hall, engr.

Tex., San Antonio—City, G. B. Mauermann, mayor, City Hall, main library bldg. unit, $150,000; 4 public library units, $300,000, L. M. J. Dielmann, 145 North St., consult. archt. E. A. Baugh, City Hall, engr.

Tex., San Antonio—City, City Hall, administration bldg. and ramp, $200,000. M. L. Diver, 1104 Main St., and Thos. Coghill, City Hall, engrs.

Tex., Wichita Falls—Bd. Educ., City Hall, plans 10% completed by Voelcker & Dixon, Wichita Falls, repairing, altering schools, $200,000; plans 25% completed by Voelcker & Dixon, Wichita Falls, school bldg. units, $175,000.

★**Wash., Seattle**—Seattle Public Library, 4 Ave. and Madison Sts., Zone 1, plans by J. P. Jones, Hoge Bldg., Zone 4, 3 story library addn. $1,500,000. CD 12/30—ENR 1/13.

Wis., Janesville—City, H. Traxler, mgr., City Hall, plans under way 1 story, 94 x 250 ft., steel, brick garage. J. Lustig, City Hall, city engr.

READY FOR BIDS.

Calif., San Bernardino—San Bernardino Co., San Bernardino, plans completed highway garage and district yard imprvs. $40,000. Funds available.

Mass., Walpole—Norfolk County Agricultural School, Main St., plans completed by Cram & Ferguson, 248 Boylston St., Boston, 2 story, bsmnt., brick, steel school. $150,000. CD 10/12—ENR 11/2.

N. M., Roswell—New Mexico Military Institute, Roswell, plans completed barracks and imprvs. $185,000. Funds available.

N. M., Santa Fe—City, City Hall, plans completed completing high school. $165,000. Funds available.

N. M., State College—New Mexico College of Agriculture and Mechanic Arts, State College, plans completed Student Union Bldg. $250,000. Funds available.

N. Y., New York—Dpt. P. Wks., Municipal Bldg., Zone 7, plans completed by Shreve, Lamb & Harmon, 11 W. 44 St., Zone 18, replacing stonework at City Hall, PB-33, $310,000. CD 36—ENR 3/23.

N. C., Raleigh—State Hospital, Raleigh, Dr. J. Owens, supt., plans completed by Northrup & O'Brien, Winston Salem, 4 story central administration bldg., at Dix Hill. Over $350,000.

★**Ohio**—State Dpt. Welfare, H. R. Mooney, dir., State Office Bldg., Columbus, plans completed by T. E. Brand, state archt.,

POSTWAR PROJECTS (Cont'd.)

State Office Bldg., Columbus, bldgs. at Hawthornden State Hospital located between Akron and Cleveland, $1,000,000.

O., Athens—State Dpt. Welfare, H. R. Mooney, dir., State Office Bldg., Columbus, plans completed by T. E. Brand, state archt., State Office Bldg., Columbus, bldg. at Athens State Hospital, $220,000. CD 9/23/43—ENR 10/7/43.

O., Columbus—State Dpt. Welfare, H. R. Mooney, dir., 108 State Office Bldg., plans completed by T. E. Brand, state archt., State Office Bldg., bldg. at Columbus State Hospital, $300,000. CD 9/23/43—ENR 9/30/43.

O., Lima—State Dpt. Welfare, H. R. Mooney, dir., State Office Bldg., Columbus, plans completed by T. E. Brand, state archt., State Office Bldg., Columbus, bldgs., at Lima State Hospital. $250,000.

★O., Wooster—State Dpt. Welfare, State Office Bldg., H. R. Mooney, dir., Columbus, plans completed by T. E. Brand, state archt., State Office Bldg., Columbus, bldgs. at Apple Creek Institution for Feebleminded. $1,500,000.

★Tex., Houston—Harris Co., c/o Judge, Court House, plans completed courthouse. $3,000,000. Bonds voted. H. Zapp, Courthouse, engr. CD 11/3.

COMMERCIAL BUILDINGS

PROPOSED WORK

★Conn., Manchester—Manchester Memorial Hospital, 71 Haynes St., brick, steel hospital wing addn. $500,000.

Conn., New London—J. S. Silverstein, 1065 Ocean Ave., residential development, frame cottages, Sunset, Longview, Vista and Clements Sts. $150,000.

La., Alexandria—Officials of Alexandria Golf & Country Club, Chas. M. Waters, pres., Alexandria, constructing clubhouse, swimming pool, golf course and tennis court. $150,000.

★Mass., Lexington—J. A. Carig, 1374 Massachusetts Ave., Cambridge, 225 home residential development, single houses, Valleyfield and Spring Sts., Concord Turnpike. Over $1,000,000.

★Mo., St. Louis—St. Louis University, Rev. P. J. Holloran, S.J., pres., 221 North Grand Blvd., Zone 1, brick, concrete, stone bldgs., incl. library, vicinity Grand and Lindell Blvds., $600,000; physics and geophysics bldg., Lindell near Grand Blvds., $250,000; biology and chemistry bldg., Lindell near Grand Blvds., $250,000; classroom bldg. on Lindell Blvd. east of present school of commerce bldg., $400,000; nurses' home, Grand Blvd. and Vista Ave., $300,000; residence hall, near Grand and Lindell Blvds., $300,000. Financing campaign in progress.

★Mo., St. Louis—Syndicate, c/o E. K. Schwartz, atty., Wainwright Bldg., 7 and Chestnut Sts., Zone 1, remodeling coliseum on Jefferson Ave. between Washington Ave. and Locust St., to large recreational and amusement center incl. indoor swimming pool. $500,000.

Neb., Blair—Dana College, N. T. Lund, secy., Blair, administration bldg. $150,000.

N. H., New London—Colby Junior College, New London, brick, stone theater and Fine Arts Bldg., $250,000; brick, stone library, $150,000.

★N. Y., Douglaston—Realty Associates, Inc., 162 Remsen St., Brooklyn, Zone 2, acquired 19 acres on Horace Harding Blvd. and Little Neck Parkway, for housing. $500,000.

N. Y., Flushing—Realty Associates, Inc., 162 Remsen St., Brooklyn, Zone 2, garden apartments, 38 Ave. between 147 and 149 Sts. Over $150,000. Land acquired.

N. Y., Saratoga Springs—Skidmore College, 46 Circular St., dormitory. $200,000.

N. C., Charlotte—Meyers Park Club, Dr. R. Jarrett, chn. Bldg. Com., Independence Bldg., sketches club bldg. $150,000.

★O., Akron—Peoples Hospital, c/o P. Craig, 256 W. Cedar St., brick, stone, rein.-con. hospital addn. $500,000.

★O., Cincinnati—Bethesda Hospital, Reading Rd., Oak and Winslow, Dr. J. A. Diekmann, supt., nurses' dormitory. $500,000.

O., Cleveland—Carnegie Center Co., c/o T. W. Grogan, Hanna Bldg., office bldg. $400,000. Site purchased.

O., Cleveland—St. Jerome's Catholic Church, Rev. L. H. Hammer, 15000 Lake Shore Blvd., stone, steel, concrete church. $300,000.

★O., Delaware—Ohio Wesleyan University, Dr. H. J. Burgstahler, pres., Delaware, student memorial center, $300,000; men's memorial dormitory, $400,000; rehabilitation existing bldgs., $200,000.

★O., Oxford—McCullough Memorial Hospital, Dr. P. G. Smith, chn. Bd., Union Central Bldg., Cincinnati, hospital, Church and Poplar Sts. $600,000. Funds available.

Pa., Phila.—L. A. Lawler, c/o R. H. Greenberg, Architects Bldg., purchased 120x606 ft. site at 32 and Walnut Sts., for commercial bldgs.

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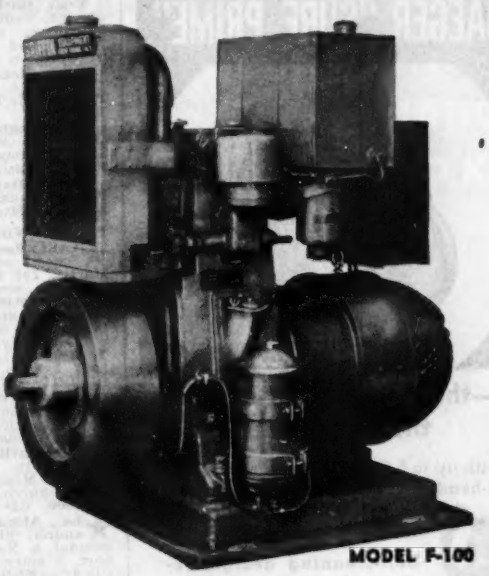

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POSTWAR PROJECTS (Cont'd.)

Tex., Harlingen—St. Anthony's Catholic Church, Congregation, 1003 E. Harrison St., Harlingen, convent high school, $150,000; rectory and recreation bldg., $150,000, both at Harrison and 10 Sts. Site purchased.

Tex., Houston—Baylor Medical College, 509 Lincoln St., medical bldg., in honor of Rev. W. M. Tyron, $150,000. Funds partially financed.

★**Washington**—Rainier National Park Co., P. H. Sceva, pres., Provident Bldg., Tacoma, tourist hotel at Paradise Valley, Rainier National Park. $400,000.

Wash., Dayton—Seventh Day Adventists, W1524 Jackson St., Spokane, academy. $350,000. Site selected.

PLANS UNDER WAY

★**Calif., Los Angeles**—The May Co., 3 and Bway., plans 90% completed by A. C. Martin, 233 Higgins Bldg., 5 story, bsmnt., 80x170 ft., steel department store bldg. addn. Over $1,000,000. CD 8/24—ENR 9/7.

Conn., Stamford — First Presbyterian Parish, G. Stewart, pastor, 90 Broad St., plans by Wyeth & King, 22 E. 57 St., New York, N. Y., church, tower with Carillon Bell System, Bedford St. Over $150,000. CD 6/15—ENR 7/13.

★**Conn., West Haven**—G. Kohary, 41 Blackman Pl., Bridgeport, plans under way 500 brick, wood homes, 175 acre site, Greist Woods. $5,000,000.

Ill., Danville—Central Christian Church, 1033 North Walnut St., plans by A. F. Wiches, Missions Bldg., Indianapolis, Ind., brick church, English and Vermilion Sts. $150,000. CD 10/11—ENR 11/2.

★**La., Alexandria**—Baptist Hospital, Alexandria, plans 10% completed by Neild, Somdal & Neild, City Bank Bldg., Shreveport, 5 story hospital bldg. addn. $600,000. CD 9/7—ENR 9/21.

★**La., New Orleans**—F. J. Monteleone, Monteleone Hotel, Royal and Iberville Sts., plans by Wogan & Bernard, Barrone Bldg., 250 room Monteleone Hotel annex. $1,000,000.

Me., Lewiston—Bd. Trustees, Bates College, plans by Coolidge & Carlson, 21 Institution Ave., Newton, 2 story, bsmnt. men's common bldg., brick, Chase Hall, $150,000; 1 and 4 story, bsmnt., brick library addn., $175,000.

Mass., Boston — Boston University, 688 Boylston St., plans by Cram & Ferguson, 248 Boylston St., brick, steel School of Theology, Granby St. and Bay State Rd., over $150,000; college infirmary unit, Bay State Rd. and Granby St., $150,000. CD 12/15—ENR 1/13.

Mass., Leominster—Sisters of Notre Dame, Julie Country Day School, Leominster, plans by A. J. Roy, 22 Elm St., Worcester, 2 story, bsmnt., concrete, brick high school and gymnasium, Lindell and Abbott Aves., $200,000; 2 story, bsmnt., concrete, brick school, Lindell and Abbott Aves., $200,000. Financing not provided for.

Mass., Worcester—Assumption College, 5 Assumption Ave., sketches by A. J. Roy, 22 Elm St., 2 story, bsmnt., 60x325 ft., brick, stone administration bldg., concrete fdn., $250,000; 2 and 3 story, bsmnt., 60x155 ft., brick, stone study hall and auditorium, concrete fdn., $150,000, all on Burncoat St. Financing not provided.

Minn., Minneapolis — Christ Evangelical Lutheran Church, J. H. Deckman, pastor, 34 Ave. S. and 33 St., plans by Lang & Raugland, 502 Wesley Temple Bldg., church. $150,000.

Mo., University City (br. St. Louis)—St. Louis Archdiocese of the Catholic Church, c/o Archbishop J. J. Glennon, 4901 Lindell Blvd., St. Louis, Zone 8, preliminary sketches by Carroll & Dean, R. A. Long Bldg., Kansas City, and Chase Hotel, St. Louis, Zone 5, 2 and 3 story, brick, rein.-con., stone high school, Olive St. road east of Pennsylvania Ave. $300,000-$400,000. Campaign for funds in progress. CD 11/15—ENR 12/2, under St. Louis.

★**N. J., Princeton**—Princeton University, Princeton, plans by R. B. O'Connor & W. H. Kelham, Jr., 101 Park Ave., Zone 17, New York, N. Y., library. $3,500,000.

★**N. Y., New York**—City Bank Farmers Trust Co., 22 William St., Zone 5, plans by H. I. Feldman, 514 Lexington Ave., Zone 17, 16 story apartment, 418-40 E. 79 St., $1,000,000; 16 story apartment, 119-25 Seventh Ave., $600,000; 8 story apartment, 147-157 W. 17 St., $275,000.

★**O., Cincinnati**—Cincinnati Arena, Inc., plans by F. W. Garber, Union Central Bldg., convention hall and sports arena bldg., Main and Second Sts. $1,000,000.

★**O., Columbus**—D. M. Casto, 145 N. High St., plans by J. E. Outcalt, 5430 Olentangy River Rd., 124 family apartment and business bldg. $1,000,000.

★**O., Columbus**—West Gate Way, Inc., plans by C. L. & C. Curtis Inscho, 145 N. High St., 120 family apartment, business center, W. Broad St. and Hague Ave. $500,000.

★**O., Dayton**—Miami Valley Hospital Assoc., 61 Magnolia St., Dayton, plans by Schenk & Williams, Third National Bank Bldg., hospital. $3,500,000.

O., Dayton—Young Women's Christian Assn., 141 W. 3 St., plans by R. Rosser, 39 E. First St., 2 story, brick bldg. $250,000.

O., Lakeside—The Lakeside Foundation, P. J. Slack, pres., 5642 Bway., Cleveland, plans by G. E. Scott, Citizens Bank Bldg., Norwalk, 6 to 7 brick bldgs., incl. assembly bldg., kitchen and cafeteria bldg., dormitories. $175,000.

O., Martins Ferry—Martins Ferry Hospital, 32 N. Third St., R. Bront, supervising, plans by F. Faris, 1117 Chapline St., Wheeling, W. Va., hospital remodeling and addn. $275,000.

Tex., Mission—Mission Citizens, c/o J. H. Drake, Chamber of Commerce, plans 10% completed by W. Ahlschlager, Mercantile Bldg., brick, rein.-con., stucco, Spanish type resort hotel, rein.-con. outdoor swimming pool. $150,000.

Tex., Odessa—G. Elliott, Odessa, plans 10% completed by Haynes & Strange, Myrick Bldg., Lubbock, hotel and stores. $150,000. Zumwalt & Vinther, Mercantile Bank Bldg., Dallas, consult. engrs.

Tex., San Antonio—Travis Park Methodist Church, Navarro and Travis Sts., plans 5% completed by H. Steinbomer, 502 Funston Pl., church. $361,000. CD 10/11—ENR 10/19.

Wash., Parkland—Pacific Lutheran College, Parkland, plans completed by Lea, Pearson & Richards, Tacoma Bldg., Tacoma, 3 story, 120x142 ft., rein.-con. gymnasium. $175,000. Financing not provided for. CD 11/8.

Wis., Milwaukee — Evangelical Deaconess Hospital, 1821 W. Wisconsin Ave., Zone 3, plans by Schmidt, Garden & Erickson, 104 S. Michigan Ave., Chicago, Ill., rein.-con., brick, steel, stone hospital addn., power plant, etc. $400,000.

READY FOR BIDS

★**N. Y., New York**—Bloomingdale Bros., Lexington Ave. and 59 St., Zone 22, plans completed by Kahn & Jacobs, 2 Park Ave., Zone 16, demolition 4 story bldg., and build 11 story store bldg. at premises. $870,000.

N. Y., New York—Cabico Corp., 551 Fifth Ave., Zone 17, plans completed by B. W. Whinston, 1860 Billingsley Terrace, Zone 62, 6 story, 88x169 ft. apartment, Fairfield Ave. and 232 St. $150,000.

N. Y., New York—Estate of Sarah J. Brooks, c/o Clinton Trust Co., 857 Tenth Ave., Zone 19, plans completed by E. J. Hurley, 535 Fifth Ave., Zone 17, 16 story apartment, 369-73 W. 56 St. $435,000.

N. Y., New York—E. H. & H. A. Gerry, 270 Bway., Zone 7, plans completed by John B. Snook & Sons, V. C. Farrar, 299 Bway., Zone 7, 9 story apartment, 41 E. 62 St. $150,000.

★**N. Y., New York**—Gerry Estates, R. L. Gerry, pres., 270 Bway., Zone 7, plans completed by John B. Snook & Sons and V. C. Farrar, 299 Bway., Zone 7, 40 story, 100x131 ft. office bldg., 42 St. and Bway. $2,000,000.

★**N. Y., New York**—H. Goelet, 292 Madison Ave., plans completed by H. I. Young, c/o owner, 22 story office bldg., 15-17 Rector St., and 90-92 Greenwich St. $525,000.

N. Y., New York—I. Lipschitz, 716 Bway., Zone 3, plans completed by H. I. Feldman, 415 Lexington Ave., Zone 17, 6 story, 35x97 ft., apartment, Walton Ave. and 183 St. $150,000.

★**N. Y., New York**—Missionary Society of St. Paul the Apostle, c/o Clinton Trust Co., 857 Tenth Ave., Zone 19, plans completed by E. J. Hurley, 535 Fifth Ave., Zone 17, 19 story apartment, 6 and 54 Sts. $967,000.

N. Y., New York—101 Clark St. Corp., N. H. Brandt, pres., 12 E. 41 St., Zone 17, plans completed by O. I. Silverstone, 153 Pierrepont St., Brooklyn, Zone 2, 6 story, 90x96 ft., apartment, 229-235 E. 36 St. $160,000.

★**N. Y., New York**—1150 Park Ave. Corp., L. Brown, pres., 1819 Bway., Zone 23, plans completed by A. R. Fritz, Rockville Center, 19 story, penthouse, apartment, on 80 x 115 ft. site, Park Ave. and 70 St. $500,000.

N. Y., New York—Van Rose Management Corp., D. S. Meister, pres., 292 Madison Ave., plans completed by H. I. Feldman, 415 Lexington Ave., Zone 17, 6 story apartment, 700-708 Columbus Ave., $175,000; 6 story apartment, 710-718 Columbus Ave., $175,000.

CONTRACTS AWARDED

Minn., Minneapolis—N. P. Madsen Co., 2817 Lyndale Ave. S., and S. R. Simonsen, 4420 Garfield Ave., three 2 story, bsmnt. apartments, Grand Ave. and W. 22 St. Owner builds. $150,000.

INDUSTRIAL BUILDINGS

PROPOSED WORK

★**Fla., Sarasota**—POWER PLANT—Florida Power & Light Co., Sarasota, power plant, steam generated, with 15,000 kw. capacity and 24,000 hp. production. $1,000,000.

Ill., Hillsboro — FACTORY — Commercial Association, Inc., W. R. Adkisson, secy., 200 A South Main St., factory. $50,000.

Md., Baltimore—PLANT—National Color Printing Co., 930 E. Monument St., 2 story, bsmnt., brick, steel bldg. $50,000.

POSTWAR PROJECTS (Cont'd.)

O., Cincinnati—MANUFACTURING PLANT—Sports Products, Inc., H. Goldsmith, pres., 1230 John St., expansion, reconversion mfr. plant. $250,000.

O., Mariemont (br. Cincinnati)—MANUFACTURING—Post Glover Electric Co., E. A. Beemer, Jr., treas., 221 W. Third St., manufacturing bldg. $50,000.

★Ore., Portland—PLANT, etc.—Oregonian Publishing Co., 527 S.W. 6 St., newspaper publishing plant and radio station, Southwest Bway. and 6 Ave. S.W. $500,000. Site purchased. CD 10/11—ENR 11/2, under Unclassified.

PLANS UNDER WAY

Calif., San Francisco — WHOLESALE ★PRODUCE MARKET — San Francisco Wholesale Produce Terminal Corp., C. A. Magini, pres., plans by T. L. Pflueger, 580 Market St., wholesale produce market, incl. 2 bldgs., 940 ft. long surrounding parking court, 6 story bldg. with cold storage and office space, restaurants, public convenience stations, spur tracks for unloading, etc., Clay St. to Pacific Ave. and Front to Drumm Sts. $10,000,000.

Conn., New Haven—FACTORY—J. B. T. Instruments, Inc., 441 Chapel St., plans by Schilling & Goldbecker, 405 Temple St., brick factory, Mitchell Dr. Over $40,000.

O., Cincinnati—FACTORY—Andrew Jergens Co., J. D. Nelson, vice pres., in ★charge, 2535 Spring Grove Ave., plans under way, factory, Section Road and Penn. R. R., in Amberly Village. $1,000,000. Legal obstacles to be overcome. A. M. Kinney, Inc., Enquirer Bldg., consult. engrs.

O., Columbus—WAREHOUSE—Armstrong Furnace Co., 1620 Olentangy River Rd., plans by Robert W. Setterlin & Son, 1030 W. 2 Ave., 1 story, concrete block, structural steel warehouse. $250,000.

O., Reading—BOILER PLANT—Nivison-Weiskopf Co., Reading Rd., plans under way boiler plant. $90,000. Fosdick & Hilmer, Union Trust Bldg., Cincinnati, consult. engrs.

R. I., Providence—SERVICE STATION—Sun Oil Co., Terminal Rd., plans under way concrete, brick, steel service station at Rochambeau Ave. and Hope St. $40,000.

Tex., Palestine—PLANT—Knox Glass Bottle Co., Palestine, plans 50% completed doubling capacity of plant, $150,000.

READY FOR BIDS

Conn., Bridgeport — FACTORY — Locke Steel Chain Co., 1035 Connecticut Ave., plans completed by Westcott & Mapes, Inc., 139 Orange St., New Haven, brick, steel factory addn. $50,000.

Mass., Worcester — FACTORY — Massachusetts Steel Corp., 113 Harding St., plans completed by J. S. Bilzerian, 9 Walnut St., 1 story, 45x60 ft., brick, steel, concrete factory addn. $40,000.

CONTRACTS AWARDED

O., Columbus — LABORATORY —Agriculture Laboratories, Inc., 1145 Chesapeake Ave., general contract brick, concrete testing laboratory, to Robert W. Setterlin & Co., 1030 W. 3rd Ave. Est. $100,000. Benham & Richards, 167 E. State St., archts.

O., Columbus—PLANT—Fisher Body Co., Inc., Div. General Motors Corp., General Motors Bldg., Detroit, Mich., general contract body mfg. plant, incl. disposal plant, Georgesville Rd. and W. Broad St., to Darin & Armstrong, Inc., 1620 N. James Rd. Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., archt. Jennings & Lawrence Co., 12 N. Third St., consult. engrs.

UNCLASSIFIED

PROPOSED WORK

Conn., Manchester — WAR MEMORIAL PARK—Town, S. G. Bowers, First Selectman, Town Hall, war memorial park with recreational facilities, East Center St. Golf Field. Over $25,000.

Ia., Waterloo—STADIUM—City, City Hall, municipal baseball stadium. $75,000-$100,000; playgrounds, $35,000.

Ia., Franklin—SWIMMING POOL etc.—City, W. McKerall, Jr., mayor, City Hall, bond election soon rein.-con. outdoor swimming pool, community center. $200,000.

Mass., Boston—TELEVISION STATION—Wm. Filene's Sons Co., 426 Washington St., television station, facilities. $100,000-$200,000.

Mass., Ware — AIRFIELD — Town, First Selectman, Town Hall, airplane landing facilities, incl. grading, filling, runways. $100,000-$300,000.

Mich., Muskegon—PLAYGROUNDS—City, W. Anderson and L. Lunsford, trustees, 3 playgrounds, $350,000.

N. M., Albuquerque—SWIMMING POOL—University of New Mexico, Albuquerque, swimming pool. $30,000.

N. M., Silver City—SWIMMING POOL—New Mexico State Teachers College, Silver City, swimming pool, $50,000. Financing not provided for.

FROM ONE CONTRACTOR TO ANOTHER

"THE DAVEY PNEUMATIC SAW IS O.K."

D. D. MULLETT

GENERAL CONTRACTING - HEAVY CONSTRUCTION

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PITTSBURGH 1, PA.

Field Office
Box 511
Warren, Ohio
March 5, 1944

Streater Dredging Co.,
Beaumont, Texas. Attention: Mr. V. E. Gill

Dear Sir:

I have your letter of February 24th, inquiring relative to the efficiency of the Davey pneumatic saw.

We purchased one of their 18" saws about four months ago and are quite well pleased with its performance. Our use of it has been mostly confined to cutting trees, as we have been doing clearing for a water impounding reservoir, and I can assure you it has done for us what they claimed in their advertisement.

When we purchased the saw we anticipated that our chief use for it would be cutting off pile ends and cutting heavy timbers for false work. It works fine on this type of work.

The company that manufactures and markets the saw is:

Davey Compressor Company, Kent, Ohio.

Very truly yours,

D. D. MULLETT

By John E. Martin, Superintendent.

FOR CRIBBING, SHORING, PILING, BULKHEADING OPERATIONS—CONSTRUCTION OF BRIDGES, DAMS, MINES, ROADS, WHARFS—FELLING AND BUCKING TREES

O.K. BECAUSE it operates under or above water. Makes straight-edge cuts. Standard cross-cut saw teeth are easily sharpened. Doesn't require special sharpening equipment. Clamping device supports weight of saw. Can be used in all weather. Inexperienced workers can operate efficiently. Operator not exposed to cutting edge. Fast and economical. Ruggedly built for long service.

Available in sizes to cut up to 15", 18" and 24" diameters. Immediate deliveries are being made. See your Davey Dealer, or write Davey Compressor Co., Kent, Ohio.

Write for bulletin E-196. Davey also manufactures a complete line of Portable and Industrial Compressors . . . Heavy-Duty Truck Power Take-Offs and Portable Lighting Units.

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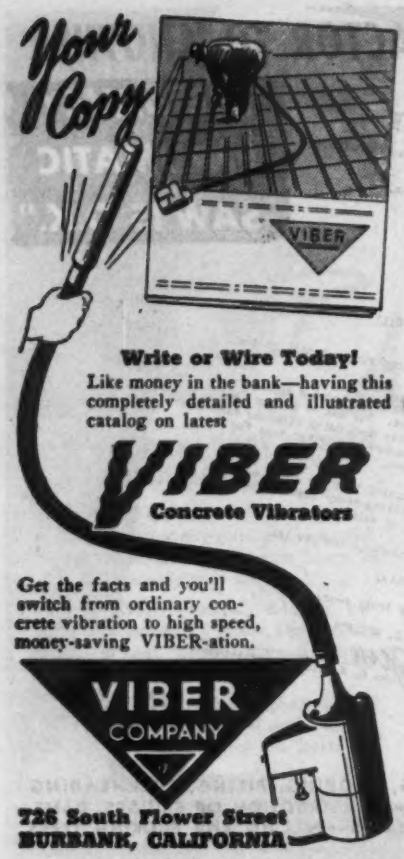

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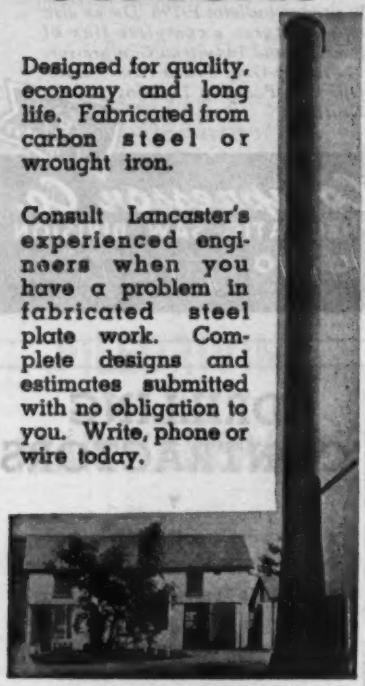

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Lancaster, Penna.

POSTWAR PROJECTS (Cont'd.)

★**Tex., Dallas**—WIND TUNNEL TESTING & RESEARCH PROJECT—Texas Post-War Planning Comn., A. Guiberson, 520 Upton St., wind tunnel testing and research project for training air mechanics and technicians. **$2,000,000.**

Tex., Sherman — AIRPORT DEVELOPMENT—City, airport development, incl. complete grounds development, runways, parking area, etc. **$150,000**; administration bldg., shop, hangars, etc., **$150,000.**

PLANS UNDER WAY

★**Calif., Alameda** — PARK DEVELOPMENTS, etc.—City, City Hall, park developments, imprvs.; golf course imprv.; street lighting; city corporation yard imprv., seawalls and levee, **$550,000.** C. Froerer, City Hall, city engr.

Calif., Modesto — STREET LIGHTING — City, 616 10 St., plans 10% completed street lighting. **$155,000.** Financing not provided for. F. J. Rossi, 616 10 St., city engr.

Calif., Modesto—SWIMMING POOL, etc.—City, 616 10 St. swimming pool, **$50,000**; recreation bldgs., **$50,000.** Financing not provided for. F. J. Rossi, 616 10 St., city engr.

Calif., National City—PARKS, etc.—City, City Hall, development addnl. parks, recreation areas. **$30,000.** Land rights not cleared and financing not provided for. C. B. Ireland, City Hall, city engr.

†**Calif., Redwood City**—PARKS, etc.—City, City Hall, plans under way imprv. parks, incl. community center, swimming pool, lake, landscaping. **$224,000.** Financing not provided for. R. J. Clarke, City Hall, city engr.

Calif., Redwood City—STREET LIGHTING—City, City Hall, imprv., exten. street lighting. **$35,000.** Land rights not cleared and financing not provided for. R. J. Clarke, City Hall, acting city engr.

Calif., Riverside—SWIMMING POOL—City, City Hall, plans completed swimming pool. **$100,000.** Financing not provided for. L. Nafzger, city engr.

Calif., Santa Monica—City, City Hall, plans 60% completed 12 tennis courts, wading pools, swimming pools, reconstruction golf course destroyed by war use, recreational bldg., and headquarters. **$307,848.** Financing not provided for. H. B. Carter, City Hall, city engr.

★**D. C., Wash.** — SUBWAY — District Comrs., District Bldg., 7.1 mi. subway sys., incl. 3.1 mi. line running from Union Station to R St. N.W., north of Dupont Circle, a 2.7 mi. section along Pennsylvania Ave. connecting the Capitol with the White House and 1.3 mi. line running along 14 St. N.W., from C St. S.W. to Thomas Circle. **$56,000,000.** J. E. Grenier Co., 1201 St. Paul Ave., Baltimore, Md., and De Leuw, Cather & Co. 20 N. Wacker Dr., Chicago, Ill., consult. engrs.

Fla., Coral Gables—PLAYGROUNDS, etc.—City G. N. Shaw, mgr., preliminary plans 10% completed developing playgrounds, **$25,000**; developing lake, city park, **$10,000.** Financing not provided for. M. B. Garris, 1213 Congress Bldg., Miami, consult. engr.

★**Fla., Miami**—SEAPORT AND AIRPORT—City, City Hall, plans 75% completed seaport and airport, at Virginia Key Proj., **$8,482,500.** Land rights not cleared and financing not provided for. C. S. Nichols, City Hall, city engr.

★**Fla., Miami**—STADIUM—City, plan 70% completed stadium **$600,000**, land rights not cleared and financing not provided for; plans 60% completed exten. park and playgrounds, incl. waterfront erosion control in parks **$38,500**, playgrounds **$210,000**, 3 swimming pools **$120,000**, baseball field **$62,675**, 5 community centers **$225,000**, miscellaneous work **$26,325**, financing not provided for. C. S. Nichols, City Hall, city engr.

★**Fla. Miami** — LANDSCAPING, etc. — Dade Co., Court House, Zone 32, plans 25% completed landscaping, imprv. 2 mi. bathing beach, Crandon Park, at Biscayne Key, **$1,000,000**, Funds available; recreation and bathing facilities, Ocean Beach Park, **$1,000,000**, imprv. Redlands Dist. Park, **$50,000**, Financing not provided for; addnl. developments at Greynolds Park, incl. imprv. Greynolds Park, swimming pool, **$115,000**, developing 20 acres at Maule's Lake, **$50,000.** Land rights not cleared, financing not provided for; plans 50% completed developing Fairchild Tropical Gardens, County Park, **$125,000**, preliminary plans completed filling, imprv., bathing and boating facilities at Homestead Bayfront Park, **$250,000**, imprv. Matheson Hammock Park, **$100,000.** Financing not provided for; preliminary plans 20% completed construcing 2 camps at Greynolds Park Camp, **$25,000**, imprv. park, 30 acre tract Northwest 30th Ave. and 50 St. **$50,000.** Land rights not cleared, financing not provided for; park, bathing beach, **$150,000**, Financing not provided for. E. M. Rader, 1301 Court House, Zone 32, co. engr.

Fla., Miami Beach—PARKS, etc.—City, C Renshaw, mgr., City Hall, plans 50% com pleted imprv. parks, **$136,000**; plans 75% completed rebuilding 2 golf courses, **$86,00** Financing not provided for.

Fla., Miami Shores—YACHT BASIN, etc —Village, C. L. McCall, mgr., preliminary plans completed 200 x 300 ft. yacht basi Biscayne Bay between N.E. 92 and 94 sts. incl. parking space, club house, tennis courts, drives and walks, **$150,800**; park incl. lake, walks, drives, pump house, irrigation sys., **$51,368.** Financing not provided for.

Fla., Miami Springs—PARK, etc.—City, City Hall, preliminary plans 25% completed park, tennis courts, swimming pool, **$50,-000.**

Ill., Litchfield—SWIMMING POOL—City, City Hall, preliminary sketches swimming pool. **$35,000.** E. G. Hurst, Co. Hy. Bldg., Hillsboro, consult. engr.

Ill. Peru—PARK IMPROVEMENTS—Peru Park Dist., City Hall, preliminary plans completed park imprvs., incl. shelters, some imprvs. on present swimming pool, lighting, etc. **$35,000.**

Ind., Kokomo—GRANDSTAND—City, City Hall, plans 50% completed rein.-con. grandstand. **$70,000.** Financing not provided for. L. A. Warden, City Hall, city engr. CD 7/13—ENR 8/10.

Kan., Topeka—PARK BLDGS.—City, Park Dpt., 215 E. 7 St., plans under way zoo bldg., **$37,980**; maintenance bldg., **$24,960**, both in Gage Park. Funds available. W. R. Baldry, city engr.

Mich., Escanaba — LIGHTING UNIT — City, City Hall, plans under way imprv. lighting unit. **$85,900.**

★**Mich., Grand Rapids**—PARKS, etc.—City, F. Jennings, dir. Municipal Planning Comn., imprvs., addns. for parks, playgrounds, and recreational facilities, **$924,-234.** Chas. Darling, City Hall, city engr.

Mich., Grand Rapids—STADIUM—City, City Hall, plans under way rein.-con. Stadium, S. High St. and Jefferson Ave. **$115,500.** Floyd Jennings, Grand Rapids planning dir.

Mich., Highland Park—PARK, etc.—Automobile Club of Michigan, 139 Bagley Ave., Detroit, plans by O'Dell, Hewlett & Luckenback, archts. and consult. engrs., 2317 Dime Bldg., Detroit, park, Woodward Ave. at Colorado and McLean Aves., and 1½ story, brick, steel, concrete bldg. **$100,000.**

Mich., Kalamazoo — LIGHTING UNIT — City, City Hall, plans under way public lighting unit. **$350,000.**

Mich., Norway—PARK IMPROVEMENTS—City, City Hall, plans unnder way park imprvs. **$46,620.**

Mich., Three Rivers—STREET LIGHTING SYSTEM—City, C. Conrad, mgr., City Hall, installing new street lighting sys. **$50,000.** J. Cowgill, city engr.

★**Mo., St. Louis**—BASEBALL PARK—St. Louis National Baseball Club, S. Breaden, pres., 3623 Dodier St., Zone 7, preliminary plans completed by W. Levy, Railway Exchange Bldg., Zone 1, baseball park, 40,000 total seating capacity on site assembled on Chouteau Ave. between Grand Blvd. and Spring Ave. **$1,250,000.**

N. Y., Jamaica—TUNNEL SYSTEM, etc.—Dpt. P. Wks., I. V. Huie, comr., Municipal Bldg., New York, Zone 7, plans under way exten. tunnel sys., new retaining walls, yard work, at Queens General Hospital, HO-192, for Dpt. of Hospitals, 125 Worth St., New York, Zone 13, **$390,000.** R. H. Gould, Div. Dir. Engr. CD 1/21—ENR 2/10, under Earthwork, etc.

O., Westerville—SWIMMING POOL—Otterbein College, Westerville, Dr. J. R. Howe, pres., plans by Benham & Richards, 167 E. State St., Columbus, outdoor covered swimming pool. **$40,000.**

Ore., Hillsboro—SWIMMING POOL—City, City Hall, swimming pool, **$55,000.** John W. Cunningham & Associates, Spalding Bldg., Portland, consult. engrs.

★**Pa., Phila.**—SUBWAY—City, City Hall, plans 75% completed exten. Market St. Highspeed Subway, CT-3, **$24,490,000**; plans 50-60% completed exten. Frankford Elevated line in subway to Roosevelt Blvd., exten. Locust St. subway, power rectifier unit, CT 4-5-7-8, **$44,897,200.** G. Exley, dir. City Transit.

Pa., Phila. — UNDERGROUND CONCOURSE—City, City Hall, plans 75% completed completing City Hall underground concourse, CT-2, **$185,510.** G. Exley, dir. City Transit Dept.

Tex., San Antonio—RADIO STATION—K.A.B.C., Milam Bldg., plans 5% completed by B. Cocke, 1504 Milam Bldg., 2 story, rock, concrete transmitter and station bldg., antennas, etc., 9 mi. northwest of here. Over **$50,000.** CD 8/9—ENR 8/18, under Unclassified.

Tex., San Antonio — HANGARS — Texas Southern Air Lines, c/o F. E. Pummill, Majestic Bldg., plans 25% completed 20 permanent type hangars. **$300,000** or more.

POSTWAR PROJECTS (Cont'd.)

READY FOR BIDS

Alabama—RURAL ELECTRIC TRANSMISSION LINES—Black Warrior Electric Membership Corp., Demopolis, plans completed 135 mi. rural electric transmission lines, Marengo Co. **$125,000.**

Alabama—RURAL ELECTRIC TRANSMISSION LINES—Central Alabama Electric Cooperative, Prattville, plans completed 120 mi. rural electric transmission lines, Autauga Co. **$120,000.**

Alabama—RURAL ELECTRIC LINES—Joe Wheeler Electric Membership Corp., Box 231, Decatur, plans completed 150 mi. rural electric lines, Morgan Co. **$150,000.**

Alabama—RURAL ELECTRIC LINES—Wire Grass Electric Cooperative, Inc., Hartford, plans completed 50 mi. rural electric lines, Geneva Co. **$50,000.**

Ala., Sheffield — RURAL ELECTRIC TRANSMISSION LINES—City Power & Light Dpt., 3 St. and Nashville Ave., plans completed 70 mi. rural electric transmission lines. **$70,000.**

Arkansas — RURAL ELECTRIFICATION TRANSMISSION LINES — Arkansas Valley Electric Cooperative Corp., Ozark, plans completed 127 mi. rural electrification transmission lines, Franklin Co. **$127,000.**

Arkansas — RURAL ELECTRIFICATION TRANSMISSION LINES — Ashley-Chicot-Union Electric Cooperative, Inc., Hamburg, plans completed 170 mi. rural electrification transmission lines, Ashley Co. **$170,000.**

Arkansas — RURAL ELECTRIFICATION TRANSMISSION LINES—South Central Arkansas Electric Cooperative, Inc., 806 Seventh St., Arkadelphia, plans completed 165 mi. rural electrification transmission lines, Clark Co. **$165,000.**

Arkansas — RURAL ELECTRIFICATION TRANSMISSION LINES—Southwest Arkansas Electric Cooperative, 707 E. Broad St., Texarkana, plans completed 151 mi. rural electrification transmission lines, Miller Co. **$151,000.**

Colorado — RURAL ELECTRIFICATION TRANSMISSION LINES — Empire Electric Assn., Inc., Cortez, plans completed 331 mi. rural electrification transmission lines, Montezuma Co. **$331,000.**

Colorado — RURAL ELECTRIFICATION TRANSMISSION LINES—Gunnison County Electric Assn., Inc., Crested Butte, plans completed 41 mi. rural electrification transmission lines, Gunnison Co. **$41,000.**

Colorado — RURAL ELECTRIFICATION TRANSMISSION LINES—Holy Cross Electric Assn., Inc., Eagle, plans completed 195 mi. rural electrification transmission lines, Eagle Co. **$195,000.**

Colorado — RURAL ELECTRIFICATION TRANSMISSION LINES — Intermountain Rural Electric Assn, Littleton, plans completed 200 mi. rural electrification transmission lines, Arapahoe Co. **$200,000.**

Georgia—RURAL ELECTRIC TRANSMISSION LINE—Altamaha Electric Membership Corp., Lyons, plans completed 25 mi. rural electric transmission line, Toombs Co. **$25,000.**

Georgia—RURAL ELECTRIC LINES—Carroll Electric Membership Corp., Carrollton, plans completed 50 mi. rural electric lines, Carroll Co. **$50,000.**

Georgia—RURAL ELECTRIC TRANSMISSION LINE—Central Georgia Electric Membership Corp., Jackson, plans completed 323 mi. rural electric transmission line, Butts Co. **$325,000.**

Georgia—RURAL ELECTRIC LINES—Colquitt Co. Rural Electric Co., 128 1st St. S.E., Moultrie, plans completed 328 mi. rural electric lines, Colquitt Co. **$328,000.**

Georgia — ELECTRIC TRANSMISSION LINE—Jackson Electric Membership Corp., Jefferson, plans completed 158 mi. electric transmission line, Jackson Co. **$158,000.**

Georgia—RURAL ELECTRIC TRANSMISSION LINES—Hart County Electric Membership Corp., Hartwell, plans completed 159 mi. rural electric transmission lines, Hart Co. **$159,000.**

Georgia — RURAL ELECTRIC LINES — Rayle Electric Membership Corp., Washington, plans completed 90 mi. rural electric lines, Wilkes Co. **$90,000.**

Georgia—RURAL ELECTRIC LINES—Troup Electric Membership Corp., LaGrange, plans completed 112 mi. rural electric lines, Troup Co. **$112,000.**

Georgia—RURAL ELECTRIC TRANSMISSION LINES—Excelsior Electric Membership Corp., Metter, plans completed 50 mi. rural electric transmission lines, Candler Co. **$50,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Adams Electrical Cooperative, Camp Point, plans completed 130 mi. rural electrification transmission lines, Adams Co. **$130,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES — Coles-Moultrie Electric Cooperative, 212 N. 20 St., Mattoon, plans completed 200 mi. rural electrification transmission lines, Coles Co. **$200,000.**

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POSTWAR PROJECTS (Cont'd.)

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Corn Belt Electric Cooperative, Inc., 515 E. Front St., Bloomington, plans completed 125 mi. rural electrification transmission lines, McLean Co. **$125,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Edgar Electric Cooperative Assoc., Paris, plans completed 200 mi. rural electrification transmission lines, Edgar Co. **$200,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Illini Electric Cooperative, Champaign, plans completed 125 mi. rural electrification transmission lines, Champaign Co. **$125,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Jo-Carroll Electric Cooperative, Inc., Elizabeth, plans completed 80 mi. rural electrification transmission lines, Jo Daviess Co. **$80,000.**

Illinois — RURAL ELECTRIFICATION TRANSMISSION LINES—Tri County Electric Cooperative, Inc., 1106 Main St., Mt. Vernon, plans completed 200 mi. rural electrification transmission lines, Jefferson Co. **$200,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES — Carroll County REMC, Delphi, plans completed 62 mi. rural electrification transmission lines, Carroll Co. **$62,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES—Harrison County REMC, Cordon, plans completed 60 mi. rural electrification transmission lines, Harrison Co. **$60,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES—South Eastern Indiana REMC, 101 South Walnut St., Osgood, plans completed 359 mi. rural electrification transmission lines, Ripley Co. **$350,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES—Tri-County REMC, Poland, plans completed 200 mi. rural electrification transmission lines, Clay Co. **$200,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES—Utilities Dist. of Western Indiana REMC, 27 S. Franklin St., Bloomfield, plans completed 125 mi. rural electrification transmission lines, Greene Co. **$125,000.**

Indiana — RURAL ELECTRIFICATION TRANSMISSION LINES—Warren County REMC, Williamsport, plans completed 42 mi. rural electrification transmission lines, Warren Co. **$42,000.**

Iowa — RURAL ELECTRIFICATION TRANSMISSION LINES—T.I.P. Rural Electric Cooperative, Brooklyn, plans completed 80 mi. rural electrification transmission lines, Poweshiek Co. **$80,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES—D. S. & O. Rural Electric Cooperative Assn., Inc., Solomon, plans completed 93 mi. rural electrification transmission lines, Dickinson Co. **$93,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES — Nemaha-Marshall Electric Cooperative Assoc., Inc., Axtell, plans completed 229 mi. rural electrification transmission lines, Marshall Co. **$229,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES—Ninnescah Rural Electric Coop. Assoc., Inc., Pratt, plans completed 225 mi. rural electrification transmission lines, Pratt Co. **$225,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES — North Central Kansas Rural Electrification Coop. Assoc., Inc., Bellville, plans completed 173 mi. rural electrification transmission lines, Republic Co. **$173,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES — Smoky Valley Electric Coop., Assoc., Inc., Lindsborg, plans completed 118 mi. rural electrification transmission lines, McPherson Co. **$118,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES—The Brown-Atchison Electric Cooperative Assn., Inc., Horton, plans completed 60 mi. rural electrification transmission lines, Brown Co. **$60,000.**

Kansas — RURAL ELECTRIFICATION TRANSMISSION LINES—The Cooperative Power & Light Co., Inc., Iola, plans completed 100 mi. rural electrification transmission lines, Allen Co. **$100,000.**

Kan., Topeka—AIRPORT BLDGS.—City, Administration Dpt., 215 E. 7 St., plans completed administration bldg., at airport, **$150,000**; hangar, **$38,460.** Funds available. W. R. Baldry, city engr.

Kentucky—RURAL ELECTRIC TRANSMISSION LINES—Big Sand Rural Electric Cooperative, Prestonburg, plans completed 393 mi. rural electric transmission lines, Floyd Co. **$393,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES—Cumberland Valley Rural Electric Cooperative, P. O. Box 149, Pineville, plans completed 222 mi. rural electric transmission lines, Bell Co. **$222,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES — Fleming-Mason Rural Electric Cooperative Corp., Flemingsburg, plans completed 270 mi. rural electric transmission lines, Fleming Co. **$270,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES—Green River Rural Electric Cooperative Corp., 321 St. Ann St., Owensboro, plans completed 120 mi. rural electric transmission lines, Daviess Co. **$120,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES — Hickman-Fulton Counties Rural Electric Cooperative Corp., Hickman, plans completed 75 mi. rural electric transmission lines, Fulton Co. **$75,000.**

Kentucky — RURAL ELECTRIC TRANSMISSION LINES—Meade County Rural Electric Cooperative Corp., Brandenburg, plans completed 197 mi. rural electric transmission lines, Meade Co. **$197,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES—Warren Rural Electric Cooperative Corp., 201 State St., Bowling Green, plans completed 116 mi. rural electric transmission lines, Warren Co. **$116,000.**

Kentucky—RURAL ELECTRIC TRANSMISSION LINES—West Kentucky Rural Electric Cooperative Corp., Mayfield, plans completed 125 mi. rural electric transmission lines, Graves Co. **$125,000.**

Louisiana—RURAL ELECTRIFICATION TRANSMISSION LINES—Beauregard Electric Cooperative, Inc., 105 E. First St., De Ridder, plans completed 65 mi. rural electrification transmission lines, Beauregard Co. **$65,000.**

Louisiana—RURAL ELECTRIFICATION TRANSMISSION LINES—Claiborne Electric Cooperative, Inc., Homer, plans completed 414 mi. rural electrification lines, Claiborne Co. **$414,000.**

Louisiana—RURAL ELECTRIFICATION TRANSMISSION LINES—Dixie Electric Membership Corp., Zackery, plans completed 93 mi. rural electrification transmission lines, East Baton Rouge Co. **$93,000.**

Louisiana — RURAL ELECTRIFICATION TRANSMSSION LINES—Northeast Louisiana Power Coop., Inc., Winnsboro, plans completed 105 mi. rural electrification transmission lines, Franklin Co. **$105,000.**

Michigan — RURAL ELECTRIFICATION TRANSMISSION LINES—Cloverland Electric Cooperative, Sault Ste. Marie, plans completed 105 mi. rural electrification transmission lines, Chippewa Co. **$105,000.**

Michigan — RURAL ELECTRIFICATION TRANSMISSION LINES—Top O' Michigan Rural Electric Co., 319 North Lake St., Boyne City, plans completed 114 mi. rural electrification transmission lines, Charlevoix Co. **$114,000.**

Mich., Crystal Falls—POWER SUPPLY—City, W. F. Jacks, mgr., City Hall, plans completed imprv. hydro-electric power supply. **$46,130.** Holland, Ackerman & Holland, 20 N. Wacker Dr., Chicago, Ill., consult. engrs. (**Correction**—type of work). CD 10/25—ENR 11/16.

Mich., Detroit—MAUSOLEUM—Holy Sepulchre Cemetery, R. S. Clancy, dir., 1234 Washington Blvd., plans completed 82 x 200 ft. brick, stone, concrete mausoleum, with 70 ft. diam. rotunda chapel. **$400,000.**

Minnesota—RURAL ELECTRIFICATION TRANSMISSION LINES—Agra-Lite Cooperative, Benson, plans completed 175 mi. rural electrification transmission lines, Swift Co. **$175,000.**

Minnesota—RURAL ELECTRIFICATION TRANSMISSION LINES—Freeborn-Mower Cooperative Light & Power Assn., Albert Lea, plans completed 70 mi. rural electrification transmission lines, Freeborn Co. **$70,000.**

Minnesota—RURAL ELECTRIFICATION TRANSMISSION LINES—Kandiyohi Cooperative Electric Power Assn., Willmar, plans completed 161 mi. rural electrification transmission lines, Kandiyohi Co. **$161,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES—Capital Electric Power Assn., Clinton, plans completed 50 mi. rural electric transmission lines, Hinds Co. **$50,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES—Delta Electric Power Assn., Greenwood, plans completed 200 mi. rural electric transmission lines, LeFlore Co. **$200,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES — Four-County Electric Power Assn., Columbus, plans completed 129 mi. rural electric transmission lines, Lowndes Co. **$120,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES—Jones County Electric Power Assn., Laurel, plans completed 75 mi. rural electric transmission lines, Jones Co. **$75,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES—Natchez Trace Electric Power Assn., Box 232, Houston, plans completed 75 mi. rural electric transmission lines, Chickasaw Co. **$75,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES—Pearl River Valley Electric Power Assn., Court House Sq., Columbia, plans completed 85 mi. rural electric transmission lines, Marion Co. **$85,000.**

Mississippi—RURAL ELECTRIC TRANSMISSION LINES — Tri-County Electric Membership Corp., Lafayette, plans completed 105 mi. rural electric transmission lines, Macon Co. **$105,000.**

POSTWAR PROJECTS (Cont'd.)

Mississippi—RURAL ELECTRIC TRANSMISSION LINES — Twin County Electric Power Assn., Hollandale, plans completed 36 mi. rural electric transmission lines, Washington Co. $95,000.

Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES — Atchison-Holt Electric Cooperative, Rockport, plans completed 151 mi. rural electrification transmission lines, Atchison Co. $151,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES—Black River Electric Cooperative, Ironton, plans completed 241 mi. rural electrification transmission lines, Iron Co. $288,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES—Boone County Cooperative Electric Assoc., 617 Bway., Columbia, plans completed 122 mi. rural electrification transmission lines, Boone Co. $122,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES — Callaway County Electric Cooperative Assoc., Fulton, plans completed 108 mi. rural electrification transmission lines, Callaway Co. $108,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES — Central Missouri Electric Cooperative, Inc., 112 E. Fifth St., Sedalia, plans completed 90 mi. rural electrification transmission lines, Pettis Co. $90,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES—Crawford Electric Cooperative, Inc., Bourbon, plans completed 403 mi. rural electrification transmission lines, Crawford Co. $402,000.

Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES—Cuivre River Electric Cooperative, Inc., Troy, plans completed 226 mi. rural electrification transmission lines, Lincoln Co. $226,000.

★Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES — Genevieve Electric Cooperative, Inc., Ste. Genevieve, plans completed 704 mi. rural electrification transmission lines, Ste. Genevieve Co. $704,000.

Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES—Grundy Electric Cooperative, Inc., Trenton, plans completed 106 mi. rural electrification transmission lines, Grundy Co. $106,000.

Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES—Intercountry Electric Cooperative Assoc., Licking, plans completed 75 mi. rural electrification transmission lines, Texas Co. $75,000.

★Missouri—RURAL ELECTRIFICATION TRANSMISSION LINES—Sho-Me Power Cooperative, Marshfield, plans completed 1,441 mi. rural electrification transmission lines, Webster Co. $1,441,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES—Tri-County Electric Cooperative Assoc., Lancaster, plans completed 62 mi. rural electrification transmission lines, Schuyler Co. $62,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES — West-Central Electric Cooperative, Inc., Higginsville, plans completed 141 mi. rural electrification transmission lines, Lafayette Co. $141,000.

Missouri — RURAL ELECTRIFICATION TRANSMISSION LINES—White River Valley Electric Cooperative, Hollister, plans completed 126 mi. rural electrification transmission lines, Taney Co. $126,000.

Nebraska—RURAL ELECTRIFICATION TRANSMISSION LINES—Eastern Nebraska Public Power Dist., Syracuse, plans completed 174 mi. rural electrification transmission lines, Otoe Co. $174,000.

Nebraska — RURAL ELECTRIFICATION TRANSMISSION LINES — McCook Public Power Dist., McCook, plans completed 65 mi. rural electrification transmission lines, Red Willow Co. $65,000.

Nebraska—RURAL ELECTRIFICATION TRANSMISSION LINES — Madison County Rural Public Power Dist., Battle Creek, plans completed 363 mi. rural electrification transmission lines, Madison Co. $363,000.

Nebraska—RURAL ELECTRIFICATION TRANSMISSION LINES—Roosevelt Rural Public Power Dist., Mitchell, plans completed 30 mi. rural electrification transmission lines, Rice Co. $30,000.

Nebraska — RURAL ELECTRIFICATION TRANSMISSION LINES—Twin Valley Electric Membership Assn., Cambridge, plans completed 455 mi. rural electrification transmission lines, Furnas Co. $455,000.

N. Y., Jamaica—LANDSCAPING—Dpt. P. Wks., I. V. A. Huie, comr., Municipal Bldg., New York, Zone 7, plans completed landscaping at Jamaica Sewage Treatment Works, PW-16. $60,000. H. H. Gould, Div. Dir. Engrg.

N. Y., New York—COAL LOADING HOIST, etc.—Dpt. P. Wks., H. I. Huie, comr., Municipal Bldg., Zone 7, plans completed coal loading hoist, HO-122, $40,350; steam line replacement, HO-94, $37,500, both at City Home, at Welfare Island; steam line service at Metropolitan Hospital, HO-114, $35,000, for Dpt. Hospitals, 125 Worth St., Zone 13. R. H. Gould, Div. Dir. Engrg.

North Dakota — RURAL ELECTRIFICATION TRANSMISSION LINES — Baker

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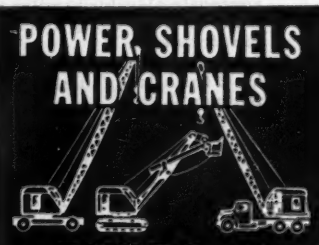

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POSTWAR PROJECTS (Cont'd.)

Electric Cooperative, Inc., Cando, plans completed 126 mi. rural electrification transmission lines, Towner Co. $126,000.

★**North Dakota**—RURAL ELECTRIFICATION TRANSMISSION LINES—Nodak Rural Electric Cooperative, Inc., Grand Forks, plans completed 675 mi. rural electrification transmission lines, Grand Forks Co. $675,000.

North Dakota—RURAL ELECTRIFICATION TRANSMISSION LINES—R.S.R. Electric Cooperative, Inc., Milnor, plans completed 310 mi. rural electrification transmission lines, Sargent Co. $310,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Belmont Electric Cooperative, Inc., St. Clairsville, plans completed 300 mi. rural electrification transmission lines, Belmont Co. $300,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES — Buckeye Rural Electric Cooperative, Inc., Gallipolis, plans completed 312 mi. rural electrification transmission lines, Gallia Co. $312,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Firelands Electric Cooperative, Inc., 3 E. Main St., New London, plans completed 171 mi. rural electrification transmission lines, Huron Co. $171,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Holmes Rural Electric Cooperative, Inc., Millersburg, plans completed 317 mi. rural electrification transmission lines, Holmes Co. $317,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES — Lorain-Medina Rural Electric Cooperative, Inc., 114 Herrick Ave. E., Wellington, plans completed 50 mi. rural electrification transmission lines, Lorain Co. $50,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES — Hancock-Wood Electric Cooperative, Inc., 116 S. Main St., North Baltimore, plans completed 286 mi. rural electrification transmission lines, Wood Co. $286,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Midwest Electric, Inc., St. Mary's, plans completed 325 mi. rural electrification transmission lines, Auglaize Co. $325,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES — North-Central Electric Cooperative, Inc., E. Tiffin St., Attica, plans completed 200 mi. rural electrification transmission lines, Seneca Co. $200,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Paulding-Putnam Electric Cooperative, Inc., 101 North Main St., Paulding, plans completed 231 mi. rural electrification transmission lines, Paulding Co. $231,000.

Ohio — RURAL ELECTRIFICATION TRANSMISSION LINES—Tri-County Rural Electric Cooperative, Inc., Napoleon, plans completed 119 mi. rural electrification transmission lines, Henry Co. $119,000.

Oklahoma—RURAL ELECTRIFICATION TRANSMISSION LINES—Caddo Electric Cooperative, Binger, plans completed 210 mi. rural electrification transmission lines, Caddo Co. $210,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES — Central Rural Electric Cooperative, 506 Main St., Stillwater, plans completed 59 mi. rural electrification transmission lines, Payne Co. $59,000.

Oklahoma—RURAL ELECTRIFICATION TRANSMISSION LINES—Cimarron Electric Cooperative, 411 N. Main St., Kingfisher, plans completed 192 mi. rural electrification transmission lines, Kingfisher Co. $192,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES—Harmon Electric Assoc., Inc., 114 North Main St., Hollis, plans completed 192 mi. rural electrification transmission lines, Harmon Co. $192,000.

Oklahoma—RURAL ELECTRIFICATION TRANSMISSION LINES—Kay Electric Cooperative, Blackwell, plans completed 90 mi. rural electrification transmission lines, Kay Co. $90,000.

Oklahoma—RURAL ELECTRIFICATION TRANSMISSION LINES—Kiwash Electric Cooperative, Inc., Cordell, plans completed 208 mi. rural electrification transmission lines, Washita Co. $208,000.

Oklahoma—RURAL ELECTRIFICATION TRANSMISSION LINES—Northeast Oklahoma Electric Cooperative, Inc., 229 S. Wilson St., Vinita, plans completed 113 mi. rural electrification transmission lines, Craig Co. $113,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES—Northfork Electric Cooperative, Inc., 116 S. Main St., Sayre, plans completed 152 mi. rural electrification transmission lines, Beckham Co. $152,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES—Oklahoma Electric Cooperative, Norman, plans completed 55 mi. rural electrification transmission lines, Cleveland Co. $55,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES — Rural Electric Cooperative, Inc., Box 68, Lindsay, plans completed 85 mi. rural electrification transmission lines, Garvin Co. $85,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES — Southwest Rural Electric Assn., Inc., Tipton, plans completed 153 mi. rural electrification transmission lines, Tillman Co. $153,000.

Oklahoma — RURAL ELECTRIFICATION TRANSMISSION LINES—Verdigris Valley Electric Cooperative, Inc., 1111 Main St., Collinsville, plans completed 73 mi. rural electrification transmission lines, Tulsa Co. $73,000.

South Carolina — RURAL ELECTRIC LINES—Little River Electric Cooperative, Inc., Abbeville, plans completed 177 mi. rural electric lines, Abbeville Co. $177,000.

South Carolina — RURAL ELECTRIC LINES—Palmetto Electric Cooperative, Inc., Ridgeland, plans completed 266 mi. rural electric lines, Jasper Co. $266,000.

South Carolina — RURAL ELECTRIC LINES—York County Electric Cooperative, Inc., plans completed 146 mi. rural electric lines, York Co. $146,000.

South Dakota—RURAL ELECTRIFICATION TRANSMISSION LINES — Lincoln-Union Electric Co., Alcester, plans completed 300 mi. rural electrification transmission lines, Union Co. $300,000.

South Dakota—RURAL ELECTRIFICATION LINES—Sioux Valley Empire Electric Assn., Inc., Colman, plans completed 292 mi. rural electrification transmission lines, Moody Co. $292,000.

Tennessee—RURAL ELECTRIC TRANSMISSION LINES — Cumberland Electric Membership Corp., Clarksville, plans completed 180 mi. rural electric transmission lines, Carroll Co. $180,000.

Tennessee—RURAL ELECTRIC TRANSMISSION LINES — Duck River Electric Membership Corp., Box 333, Shelbyville, plans completed 100 mi. rural electric transmission lines, Bedford Co. $100,000.

Tennessee—RURAL ELECTRIC LINES—Meriwether-Lewis Electric Corp., Centerville, plans completed 60 mi. rural electric lines, Hickman Co. $60,000.

Tennessee—RURAL ELECTRIC TRANSMISSION LINES—Pickwick Electric Membership Corp., Selmar, plans completed 50 mi. rural electric transmission lines, McNairy Co. $50,000.

Tennessee—RURAL ELECTRIC TRANSMISSION LINES—Tennessee Valley Electric Cooperative, Savannah, plans completed 90 mi. rural electric transmission lines, Hardin Co. $90,000.

Tenn., Dickson — RURAL ELECTRIC TRANSMISSION LINES—Town, plans completed 65 mi. rural electric transmission lines. $65,000.

★**Tex., Houston**—TUNNEL, etc.—Harris Co., c/o Judge, Court House, plans completed tunnel work at Morgans Point and Pasadena, $3,750,000. Bonds voted. H. Zapp, Court House, engr. CD 10/11—ENR 11/2.

Wisconsin—RURAL ELECTRIFICATION TRANSMISSION LINES—Bayfield Electric Cooperative, Inc., Iron River, plans completed 150 mi. rural electrification transmission lines, Bayfield Co. $150,000.

Wisconsin—RURAL ELECTRIFICATION TRANSMISSION LINES—Buffalo Electric Cooperative, Alma, plans completed 40 mi. rural electrification transmission lines, Buffalo Co. $40,000.

Wisconsin—RURAL ELECTRIFICATION TRANSMISSION LINES—Eau Claire Electric Cooperative, Eau Claire, plans completed 50 mi. rural electrification transmission lines, Eau Claire Co. $50,000.

Wisconsin—RURAL ELECTRIFICATION TRANSMISSION LINES—Marathon-Portage Electric Cooperative, Inc., Wausau, plans completed 150 mi. rural electrification transmission lines, Marathon Co. $150,000.

Wisconsin — RURAL ELECTRIFICATION TRANSMISSION LINES—Oakdale Cooperative Electrical Assoc., Oakdale, plans completed 100 mi. rural electrification transmission lines, Monroe Co. $100,000.

Wisconsin — RURAL ELECTRIFICATION TRANSMISSION LINES—Washington Island Electric Coop., Inc., Washington Island, plans completed 26 mi. rural electrification transmission lines, Door Co. $26,000.

Wisconsin—RURAL ELECTRIFICATION TRANSMISSION LINES—Waupaca Electric Cooperative, Iola, plans completed 30 mi. rural electrification transmission lines, Waupaca Co. $30,000.

Wyoming — RURAL ELECTRIFICATION TRANSMISSION LINES—Carbon Power & Light, Inc., Saratoga, plans completed 55 mi. rural electrification transmission lines, Carbon Co. $55,000.

Wyoming — RURAL ELECTRIFICATION TRANSMISSION LINES — Hot Springs County Rural Electric Assn., Thermopolis, plans completed 88 mi. rural electrification transmission lines, Hot Springs Co. $88,000.

★**Wyoming**—RURAL ELECTRIFICATION TRANSMISSION LINES—Rural Electric Co., Pine Bluffs, plans completed 735 mi. rural electrification transmission lines, Laramie Co. $735,000.

Wyoming — RURAL ELECTRIFICATION TRANSMISSION LINES — Shoshone River Power, Inc., 1249 Sheridan Ave., Cody, plans completed 43 mi. rural electrification transmission lines, Clark Co. $43,000.

CONSTRUCTION REPORTS

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *SCOTT McLEOD, Statistics* — *J. A. MAHONEY, Reports*

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WATER SUPPLY

PROPOSED WORK

Ga., Pine Lake—City, H. D. Guthrie, mayor, Rt. 1, Stone Mountain, approved $12,000 bond issue WW facilities, incl. mains, chlorinator, etc. CD 10/24—ENR 10/26.

Okla., Calumet—Town, WW imprvs. $35,000. C. E. Bretz, 1221 N. Penn. St., Oklahoma City, engr. CD 7/19—ENR 7/27.

Okla., Coweta—Voted $25,000 bonds, WW imprvs.

R. I., Bristol—Bristol County Water Co., 551 Hope St., preliminary surveys, water sys. imprvs., Bristol, and incl. towns of Warren and Barrington. Over $15,000. C. A. Maguire & Associates, 1515 Turks Head Bldg., Providence, engrs.

Tex., Colorado City—J. A. Sadler, mayor, City Hall, rejected bids Oct. 31, WW imprvs., incl. overhead reservoir. $150,000. Will readvertise. CD 11/8—ENR 11/16, under LB.

Tex., Houston—Jno F. Scott, Commerce Bldg., water facilities for 210 acre subdivision. Over $15,000.

Tex., San Antonio—City, City Hall, 3 mi. 6 or 8 in. c.i. watermains to municipal airport, also providing pressure sys. Over $15,000. T. Coghill, City Hall, engr.

Wis., Mount Horeb—Village, C. Gesme, clk., City Hall, new well, deep well turbine pump, 2 booster pumps, surface reservoir, pump. station, $15,000-$20,000. W. G. Kirchoffer, 22 N. Carroll St., Madison, engr.

★**Va., Richmond**—Dpt. P. Utilities, 217 Governor St., altering reservoir. $500,000.

Alta., Sacre Coeur (Peace River Dist.)—Municipality, WW. $25,000.

Alta., St. Jean Baptiste de McLennan (Peace River Dist) — Municipality, plans water supply, and other works. $35,000.

N. B., Saint John—Municipality, 8 in. watermain to plant of International Fertilizers Ltd., East St. John. $15,000. W Smith, City Hall, Saint John, works mgr.

N. S., Halifax—City Clerk, water supply scheme, getting water from lakes near Birch Cove in Fairview Sect. and Peter Lake, ¾ mi. from Spruce Hill Lake. E. W. L. Doane, City Hall, engr.

Ont., Cooksville—Toronto, Twp. Cooksville, filtration plant. $125,000. Gore & Storrie, 1130 Bay St., Toronto, engrs.

Ont., Dresden — Municipality, WW. $25,000.

Ont., Hagersville — Municipality, WW. $45,000.

Ont., Harrow—Municipality, WW sys. $40,000.

Ont., Penetanguishene — Municipality, watermain connections in several dead end streets. $20,000. Water & Light Com., Town Hall, engrs.

Ont., Port Carling—Municipality, WW sys. imprvs. $35,000.

Que., Riviere du Loup—Municipality, J. Lebel, clk., WW sys. imprvs. $50,000. Pitometer Co., Inc., 50 Church St., New York 7, N. Y., engrs. CD 10/5—ENR 10/12.

Que., St. Emile—Municipality, water hydrant sys., imprvs. $20,000.

Que., St. Michel du Squatteck (P. O. Squatteck)—La Cie d' Aqueduc de St. Michel du Squatteck, St. Michel du Squatteck, plans WW sys. $25,000.

Sask., Aberdeen—Rural Municipality of Aberdeen, c/o D. B. Wylie, secy., WW. $30,000.

BIDS ASKED

Bids Asked December 6

Ind., Veedersburg—Town Bd., D. Banta, clk., City Hall, WW imprvs., extens., incl. 200,000 gal. ellipsoidal tank, rein.-con. tank fdn., 12,201 lin. ft. ¾- to 12-in. c.i. and wrought iron pipe, fittings, 40 hydrants, 608 meters, yokes and boxes, 91 valves, 2 turbine pumps, 2 concrete block pump houses. Plans deposit $20. Macy Snyder Engr. Co., P. O. Box 207, Hillsboro, consult. engr. CD 10/16—ENR 10/19.

Bids Asked December 7

La., New Orleans—Purchasing Agent Sewerage & Water Bd., 526 Carondelet St., furnishing, laying approx. 550 lin. ft. 4 and 6 in. c.i. watermains, Contr. 243-W; 1,770 lin. ft. 6 and 12 in. c.i. watermains, Contr. 241-W.

Mass., Fall River—City Auditor, City Hall, 12 m.g. motor centrifugal pump and control equip. for Watuppa Water Bd. $15,000.

Bids Asked December 13

†Ill., Chicago—Dpt. P. Wks., O. E. Hewitt, comr., City Hall, furnishing, del. 15,000 ft. 36 in. water pipe and special connection fittings for same, on Wabansia and Mason Aves., City Spec. 39-44, **FWA** Ill. 11-321-N., adv. ENR 11/30. CD 10/19—ENR 10/26.

Location of ENR Correspondents

Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD Engineering New-Record Construction Daily

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger; water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED: (except Streets & Roads): BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR);

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Bids Asked

Mass., Palmer—Town, Town Hall, complete water sys., Three Rivers. Over $15,000. Whitman & Howard, 89 Broad St., Boston, engrs. CD 7/31—ENR 8/3.

R. I., Pascoag—Town, Pascoag Fire Dist., H. Gaunt, chn., water sys. exten., incl ¼ mi. pipeline, connecting 2 new wells with system. CD 11/13—ENR 11/16.

LOW BIDDERS

Ind., Tell City—City Electric Dpt., M. J. Kreisle, chn., N. Beumel, clk., City Hall, Nov. 14, WW imprvs., incl. 400,000 gal. elevated steel tank, 90 ft. high, from Pittsburgh-Des Moines Steel Co., 35 S. Dearborn St., Chicago, Ill., riveted tank, $32,200; watermains, valves, fittings, from O. Brandon, Troy, and 2120 E. Jefferson St., Detroit, Mich., $18,000. CD 10/23—ENR 10/26.

Me., Waterville — Trustees Kennebeck Water Dist., A. B. Thompson, supt., Nov. 14, 26,400 ft. 16 in. watermain, from A. D. Daddario, 52 Chauncy St., Boston, Mass., $63,040. CD 10/31—ENR 11/2.

CONTRACTS AWARDED

†Ga., Savannah—U. S. Eng., Post Office Bldg., pump house, Contr. W-09-133-Eng-474, to Espy Paving & Constr. Co., 108 E. Bay St., $19,236.

N. J., Burlington—Town, c/o M. Paul Auston, engr., 220 High St., constructing 10,500 ft. c.i. pipes, fittings, valves, valve boxes, fire hydrants and 20,000 yds. road grading, to Acchione Const. Co., 1607 McKean Ave., Phila., Pa., $25,533. Bids 11/2.

†Wash., Annapolis (mail Retail) — Pub. Housing Auth., NHA, Skinner Bldg., Seattle Zone 1, drilling well, to N. C. Jansen Drilling Co., 9407 E. Marginal Way, Seattle, $34,921. Bids and awarded 11/16. E. A. Duffy, 4 and Cherry Bldg., Seattle, Zone 4, engr.

†Wash., Port Orchard—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Seattle, Zone 1, exten. water sys. at East Port Orchard Housing, to Begesen, Wick & Dahlgren, Route 1, Tacoma, $47,537. Bids and awarded 11/16. E. A. Duffy, 4 and Cherry Bldg., Seattle, Zone 4, engr.

Wis., Preble—Preble Utilities Comn., Preble, drilling well, to Layne-Northwest Co., 709 N. 11 St., Milwaukee, Zone 3, $18,348. Bids 11/6. McMahon Engrg. Co., 124 Main St., Menasha, engrs.

Wis., Waukesha—Water Utility Comn., 132 North St., deep well, to R. A. Milaeger, 4738 W. Lisbon Ave., Milwaukee, Zone 8, $21,700. A. P. Kuranze, c/o owner, engr. Bids 11/16.

Ont., Woodbridge—Municipality, E. W. Brown, clk., watermain extens., to Scott-Jackson Constr., Ltd., 7 Evans Ave., Etobicoke. Est. $15,000. CD 8/23—ENR 8/31.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

†Colo., Denver—U. S. Eng., 909 17 St., Denver, storm water drainage sys., at Fitzsimons General Hospital, $80,000.

Ind., Michigan City — Pottawattomie Manor, Inc., Brinckmann Bldg., preliminary plans storm water and sanitary sewers, street paving, curbing, gutters, sidewalks, subdivision development. $100,000. Phelps & Peck, Brinckmann Bldg., engrs.

Ind., Plymouth — City Council, J. A. Broman, mayor, chn., M. D. Strombeck, clk., City Hall, surveys, etc., sewage treatment plant and sewerage sys. Henry B. Steeg & Associates, 809-129 E. Market St., Indianapolis, consult. engrs.

Kan., Abilene—City, W. Johnson, mgr., outfall sewer. $45,000. Wilson & Co., Salina, engrs.

La., Arabi — Thomas Serpas, pres. St. Barnard Parish Police Jury, Arabi, sanitary sewage collection and disposal sys. $400,000. Wm. R. Burke, Pan American Bldg., New Orleans, engr.

La., New Orleans—City, City Hall, 6 ft. deep concrete lined refuse storage pit, exten. St. Louis St. incinerator plant imprv. garbage and trash disposal sys. $100,000.

Md., Baltimore—City, City Hall, bids soon 1 story, concrete brick sewage pump station. $200,000.

★**N. Y., Idlewild**—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, plans underway, storm sewer. $3,500,000.

Okla., Guymon—City, plans bond election, sanitary sewerage sys. $30,000. F. E. Devlin, Wichita, Kan., engr.

Tex., Houston—Jno. F. Scott, Commerce Bldg., sanitary sewers in 210 acre subdivision. Over $25,000.

Tex., Houston—J. N. Edy, city mgr., City Hall, sewer line extens. $126,420. Applied for FWA funds. J. G. Turney, City Hall, dir. P. Wks.

Ont., Georgetown—Municipality, sewerage sys. and treatment plant. $60,000.

Ont., Geraldton — Municipality, sewerage sys. extens. $50,000.

Ont., Lindsay—Municipality, sewerage sys. imprvs., sewage treatment plant. $90,000.

Ont., London Twp.—Twp. Council, Blake Kennedy, clk., Bank of Montreal Chambers, repairing, rebuilding sects. Oxbow Drain. $25,000. F. Bell, Court House, St. Thomas, engr.

Ont., Port Dalhousie—Municipality, sewerage sys., sewage treatment plant. $70,000.

Ont., Richmond Hill—Municipality, sewage treatment plant. $60,000.

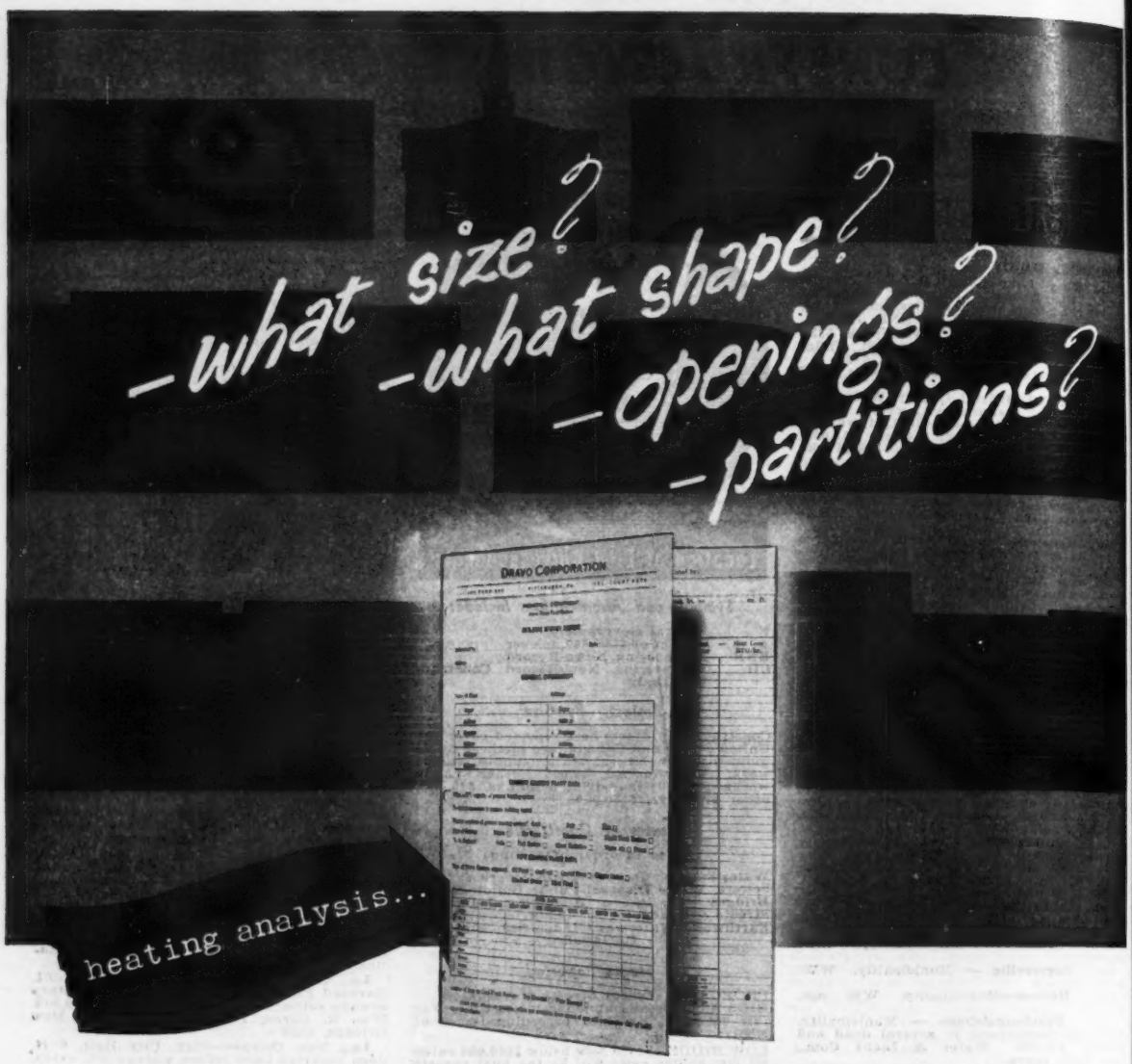
Ont., Thorold—Municipality, sewerage sys. imprvs. $50,000.

Sask., Kinderaley—W. McConnell, municipality clk., sewage and water sys. $50,000.

BIDS ASKED

Bids Asked December 8

†Va., Denbigh—Bd. Supervs. Warwick Co. at office J. C. Morris, dir. P. Wks., Hilton



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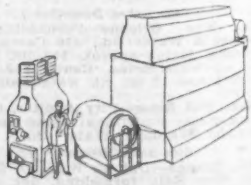

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SEWERS, WASTE DISPOSAL (Bids Asked, Cont'd.)

Village, Contr. 2, 5,424 lin. ft. 12- to 42-in. sanitary drains, necessary manholes, appurtenances, 15,132 lin. ft. various sized, precast concrete block ditch liners, Va. 44-398. FWA. Plans deposit $25. Massey & Johnson, Farr Bldg., Fairfax, and Box 488, Hilton Village, consult. engrs.

Tex., San Antonio—Bexar County Water Control & Imprvt. Dist. 5, C. W. Fenstermaker, pres., at office of A. V. Knight, 901 South Texas National Bank Bldg., sewerage collecting sys., pump. station, force and outlet mains, in Terrell Hills. Plans deposit $15. $85,000. Terrell Bartlett Engineers, 2700 Transit Tower Bldg., engrs. CD 11/10.

Bids Asked December 11

Ont., Islington—S. Barratt, clk., Etobicoke Twp., storm water sewers. $66,100. F. McArthur, Township Hall, Islington, engr. CD 11/22—ENR 9/7.

LOW BIDDERS

†Calif., Benicia — U. S. Eng., 74 New Montgomery St., San Francisco, exterior pipe in connection with sewerage sys., at Benicia Arsenal, Spec. 1458-2, from McGuire & Hester, 796 66th Ave., Oakland. $214,003.

†Calif., Hueneme—Federal Works Agency, 1206 Santee St., Los Angeles, Nov. 24, Unit 1, vitr. clay sanitary sewerage sys., for 543 war housing units, Calif. 4-660-F, from Artukovich Bros., 7320 Atlantic Ave., Hynes, $184,150; Unit 2, sanitary sewerage sys., for war housing, from A. Pinner, 116 W. 94 St., Los Angeles, $114,900. CD 11/14—ENR 11/16.

†Calif., McClellan Field—U. S. Eng., 1209 8 St., Sacramento, Zone 5, sewage plant enlargement, Spec. 937, from Fred J. Early, Jr., 649 Pine St., San Francisco, $78,362.

†Calif., San Diego—City, Civic Center Bldg., Nov. 30, 11,335 lin.ft. vitr. clay sanitary sewers, Marine Corp. Air Base across Lindbergh Field to Laurel St., Calif. 4-691-N from H. H. Peterson, 3240 Harasthy St., $90,597. Est. $150,000. FWA. CD 9/7—ENR 9/14.

†Fla., Boca Raton—U. S. Eng., Post Office Bldg., Savannah, Ga., sewerage and water distr. sys. addns., from Langston Constr. Co., 2037 N.W. 27th Ave., Miami, $30,986.

Pa., Phila.—City, Dpt. P. Wks., City Hall Annex, Nov. 15, Sched. A-1, sewers, Castor and Glendale Aves., etc., from A. Di Sandro, 917 Unruh St., $54,171***Sched. A-3, sewers in Griffith St. and Bustleton Pike, etc., from D. and C. Spinosa, 2 N. Jerome Ave., Allentown, $30,657***Sched. A-4, sewers Tabor Rd., Naple St., etc., from R. Lombardi, Real Estate Trust Bldg., $88,058.

Pa., Springfield Twp.—Springfield Twp., J. W. Calder, clk., Nov. 14, 1,200 ft. 66 in. rein.-con. storm sewer, from E. R. Sibole, Jr., 27 Waverly Rd., Morton, $27,762. Damon & Foster, Sharon Hill, engrs.

Wis., Green Bay—City, C. Centen, clk., City Hall, Nov. 15, storm sewers, from Chapple & Amundson, Grand Rapids, Mich., Contr. Y, Alt. A, $26,019; Contr. Z, Alt. B, $57,985. F. J. Steeno, city engr. CD 10/24 ENR 10/26.

CONTRACTS AWARDED

O., Cleveland—City, City Hall, sewer repairs after explosion damage, to National Constr. Co., 12202 Superior Ave., $81,178. CD 11/15—ENR 11/23.

Pa., Cheltenham—Lakeside Apts., Inc., 1700 Walnut St., Phila., outside sewers for apartment group, to Marino Mosse, 3613 N. 3 St., Phila., $26,500. W. H. Thomas, 1700 Walnut St., Phila., archt.

Pa., Phila.—City, City Hall, sewers, water supply, drainage and appurtenant work in connection with Northeast Philadelphia Airport, to Francis A. Canuso & Son, 804 S. 12 St., $53,000. Bids 11/16, awarded 11/17. CD 11/9.

BRIDGES

PROPOSED WORK

Missouri—**State Hy. Comn., Jefferson,** six 40 ft., one 80 ft. and two 60 ft. I-beam span bridge, concrete bents and piers to Rockover Davis Creek, on Kansas City-St. Louis Rd., Route 40 Proj. SN FA 238 A2, Saline Co. Over $25,000. C. W. Brown, Jefferson City, engr.

Missouri—**State Hy.** Comn., Jefferson City, rejected bids Oct. 13, bridge, Gentry Co. CD 10/19—ENR 10/26, under LB.

N. Y., Jamestown—City, Dpt., P. Wks., City Hall, major repairs to W. 3 St. viaduct over Chadakoin River Valley; W. 6 St. viaduct over same valley and to Harrison St. Bridge over Chadakoin River. $35,000-$40,000. C. J. Strandburg, City Hall, city engr.

★**Pa., East Pittsburgh**—Union R.R. Co., H. A. Sayre, ch. engr., Frick Bldg., Pittsburgh, Zone 30, soon lets contract substructure railroad bridge over Pennsylvania R.R. tracks, over Turtle Creek high grade bridge, crew dispatchers bridge over Baltimore and Ohio R.R. interlocking tracks, low grade bridge. Total est. $2,500,000. Steel superstructure awarded to American Bridge Co., Frick Bldg., Pittsburgh.

BIDS ASKED

Bids Asked December 8

Missouri—State Hy. Com., Jefferson City, grading, constructing 8 ft. span culvert, Dover East Rd., Route 24, Proj. M-16 A, Lafayette Co.; three 25 ft. continuous concrete slab span concrete bent to rock bridge over Little Blue Creek, Route 71, Proj. FA 353 F-1, Kansas City-Joplin Rd., Jackson Co.; one 70, two 60 and two 39 ft. I-beam span bridge over West Fork of Grand River, Route SH Proj. FAS 574 A2, Route 169-Route SE Rd., Gentry Co., over $25,000. C. W. Brown, Jefferson City, engr.

Tennessee—State Dpt. Hys. & P. Wks., C. W. Phillips, comr., 0.102 mi. underpass, approaches at Louisville & Nashville R.R. and State Rte. 61, near Dossett, Anderson Co.

Bids Asked December 19

South Carolina — State Hy. Dpt., J. S. Williams, ch. hy. comr., Columbia, 600 ft. rein.-con. bridge and 4,687 ft. rein.-con., structural steel bridge over Great Pee Dee River and bituminous surfacing 2.975 mi. road approaches between Florence and Marion at Mars Bluff, S. C. Docket 2134. 201-F.A. Project 2514-B, Parts 1 and 2, Florence and Marion Counties.

CONTRACTS AWARDED

Washington—State Hy. Dpt., Olympia, 15 treated timber pile trestle bridges with concrete decks and 2 rein.-con. cattle passes, King Co., to Hawkins & Armstrong, 5265 16 Ave. N.E., Seattle, $214,258. Bids 11/21. CD 11/8.

West Virginia—State Road Comn., D. M. McClaugherty, secy., Charleston, Stillwell Bridge 1624, Wood Co., to Keeley Constr. Co., Clarksburg, $36,604. Bids 11/14. CD 11/2—ENR 11/9.

Ont., Owen Sound—Grey Co., A. M. Rutherford, clk., bridge, to G. A. Gibson, Wroxeter. Est. $35,000. J. A. Fletcher County Bldg., engr. CD 6/30—ENR 7/6.

STREETS AND ROADS

BIDS ASKED

Bids Asked December 6

Louisiana—State Dpt. Hys., D. Y. Smith, dir., Baton Rouge, 9,478 cu. yd. sand clay gravel (Grade B) furnished, spot dumped on certain roads in Wards 1, 2, 3, 4, 5, 6, 7, 9 and 10 S.P. 703-01-02; 1,096 cu. yd. washed gravel, furnished, spot dumped on certain roads in Ward 8, both Caldwell Parish.

Mo., Clayton (P. O. St. Louis Zone 5)—St. Louis County, c/o St. Louis County Court, Walter E. Miller, clk., Court House, Clayton, St. Louis, Zone 5, concrete curbs, gutters, waterbound macadam surfacing 1,242 ft. Clarendon Ave. R. Jablonsky, Court House, Clayton, St. Louis, Zone 5, engr.

Bids Asked December 8

Missouri—State Hy. Comn., Jefferson City, concrete surfacing 1.088 mi. Waynesville-Rolla Rd., Route 66, Proj. SN-FA 176 B 4 B, Pulaski Co., over $25,000; grading, concrete surfacing 1.356 mi. Springfield-Airport Rd., Route 800 Proj. FA S 212 A1, Greene Co., over $25,000; grading, gravel surfacing 0.325 mi. Route 169-Rout SE, Route SH Proj. FAS 574 A2, Gentry Co. under $25,000; grading, concrete paving 0.291 mi. Route 71, Project FA 353 F1, Kansas City-Joplin Rd., Jackson Co., over $25,000. C. W. Brown, Jefferson City, ch. engr.

Bids Asked December 13

La., Port Allen—West Baton Rouge Police Jury, Port Allen, furnishing, placing on various parish roads, 7,000 cu. yd. washed gravel (spread dumped in place), 90 lin. ft. 36 in. concrete or metal pipe installed, 240 lin. ft. 42 in. concrete or metal pipe installed, repairing 2 small bridges.

Bids Asked December 15

Georgia—State Hy Dpt., Atlanta, 0.549 mi. grading, surface treating roads, 1 main bridge and 2 overflow bridges at Ogeechee River, Midville-Swainsboro Rd., beginning at Georgia and Florida Railroad in Midville and extending 0.867 mi. south toward Swainsboro, F.A.P. SN-A-FAP 387-A (4), Emanuel and Burke Counties; grading and surface treating 2.246 mi. road and 2 overflow bridges at Ogeechee River, beginning in Millen, approx. 1400 ft. north of south city limits, exten. 2.771 mi. south to intersection of State Routes 22 and 67, F.A.P. 236 (3) and 452-D (1), Jenkins Co.

Bids Asked

Missouri—State Hy. Comn., Jefferson City, rejected bids Oct. 13, imprv. 0.335 mi. Gentry Co.; 1.856 mi. Greene Co. CD 10/19—ENR 10/26, under LB.

LOW BIDDERS

California—State Div. Hys., Sacramento, Nov. 22, imprv. 0.3 mi. San Mateo Co., from Union Paving Co., 212 Babcock Bldg., San Francisco, $32,737. CD 11/6—ENR 11/9.

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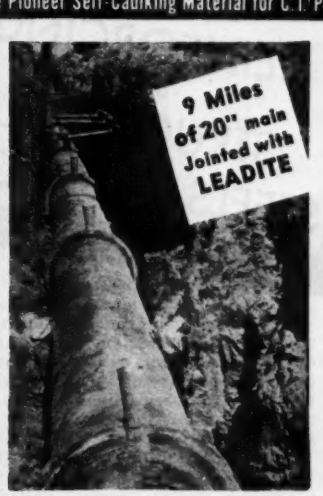

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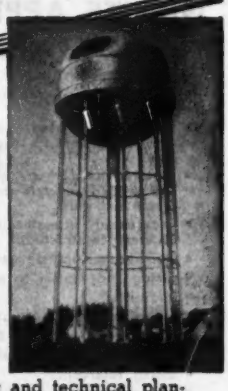

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STREETS & ROADS (Low Bidders, Cont'd.)

Illinois—Div. Hys., Springfield, Nov. 17, imprv. 0.65 mi. Williamson and Jackson Counties, from Charles B. Cochran Corp., Marion, $44,224, est. $25,000; 13.25 mi. Logan and Sangamon Counties, from Standard Paving Co., 30 N. La Salle St., Chicago, $60,995, est. over $25,000. W. W. Polk, Centennial Bldg., Springfield, ch. engr.

Louisiana—Dpt. Hys. Baton Rouge, Nov. 22, imprv. 3.9 mi. S.P. 737-00-06, Vernon Parish, from Carruth Contracting Co., Inc., Louisiana Natl. Bank Bldg., Baton Rouge, $29,981; 11.3 mi. S.P. 737-00-08, Natchitoches Parish, and 23.9 mi. S.P. 737-00-16, Vernon Parish, from Glassell General Const. Co. Inc., 1417 Dalzell St., Shreveport, $48,182 and $73,692 respectively. CD 11/10—ENR 11/16.

Louisiana—State Dpt. Hys., Baton Rouge, Rouge, Nov. 15, from W. R. Aldrich & Co., Kalwrah University Gardens, Baton Rouge, imprv. 37.6 mi. Sabine Parish, $124,325; 22 mi. Sabine Parish, $78,490; 25.8 mi. De Soto, Sabine and Natchitoches Parishes, $87,026. CD 11/18.

N. Y., Kew Gardens—President Queens Boro, Queens Boro Hall, 120-55 Queens Blvd., Zone 15, Nov. 17, from John Meehan & Son, 90 West St., New York, Zone 6, imprv. Linden and Grove Sts., $39,825; Rockaway Blvd., $51,379; 25th (Wilson) Ave., $33,406; 9 St., $53,895; Crescent St., $62,710. CD 11/8.

†**Md., Hyattsville** — Washington Suburban Sanitary Comn., Hyattsville, Nov. 17, Contr. 177-W, excav. 25,000 cu. yd., 50 cu. yd. concrete, 2,500 lin. ft. curb and gutter, 3,000 sq. yd. gravel and bituminous gravel roadway, incl. drains, seeding, sodding and planting, from State Constructing Co., Falls Rd., Baltimore, $33,035. H. R. Hall, Hyattsville, engr. CD 11/10

North Dakota—State Hy. Dpt., J. S. Lamb, comr., Bismarck, Nov. 17, structural and incidental road imprvs. 0.468 mi. hy. north of Lark, WER 11D, Grant Co., from Minneapolis Bridge Const. Co., 1049 NE 6 St., Minneapolis, Minn., $61,566*** 9.284 mi. hy. southwest of Mandan, WER 12A, Morton Co., from Lindberg Constr. Co., Jamestown, $46,372*** 0.396 mi. hy. north of Solen, WER 13, Morton and Sioux Counties, from Win Coman & Son, Bismarck, $50,406.

CONTRACTS AWARDED

Calif., Wilmington—The Texas Co., 929 S. Bway., Los Angeles, asphaltic concrete paving roads at refinery, to Sully-Miller Contg. Co., 1500 W. 7 St., Long Beach, approx. $40,000.

Florida — State Rd. Dpt., Tallahassee, grading Ocala Rock base with part surface treatment and part retread 4.202 mi. between Wauchaula and point approx. 4.3 mi. north, State Proj. Job No. 0607-110, Road 2, Hardee Co., to Nolan-Dickerson Constr. Co., Lakeland, $146,489. J. H. Dowling, state hy. engr.

Florida—State Hy. Dpt., Tallahassee, imprv. 6.272 mi. Broward Co., to R. B. Tyler Co., 1446 Levering St., Louisville, Ky., $49,577; 1.13 mi. Hillsborough Co., to L. J. & W. L. Cobb, Inc., Box 977, Tampa, $54,492; 1.5 mi. Dade Co., to Belcher Oil Co., 1221 Bisc Blvd., Miami, $25,732. Grand total $129,801. Bids 11/4. CD 11/8.

Ga., Columbus—City, M. Morton, mgr., City Hall, street paving, to H. McMath, Brennan Rd., $32,395. Bids 11/4. CD 10/24—ENR 10/26.

Minnesota—State Hy. Dpt., Windom, crushing, screening, loading, hauling, stockpiling about 16,200 cu. yd. gravel for Maintenance Div., Windom, Cottonwood Co., to W. Hodgman & Sons, Fairmont, $28,743. Bids 11/10. CD 10/25—ENR 11/2.

Mississippi—E. D. Kenna, dir. State Hy. Comn., Jackson, grading, drainage structures, paving 0.97 mi. Access Rd. to Ingalls Shipyard, Proj. DA-NI-2 (1), Jackson Co., to Stevens Bros. & The Miller-Hutchinson Co., 730 Cravier St., New Orleans, La., $110,320. Est. $98,000. Bids 11/14, awarded 11/15.

Oklahoma—At office State Hy. Comn., B. T. Childers, chn., Oklahoma City, imprv. 13.1 mi. Hy. 54, west of Guymon, and grading, drainage, traffic bound wearing surfacing 11.3 mi. Hy. 64, north of Guymon, both Texas Co., to J. T. Wilkerson, Hightower Bldg., Oklahoma City, $29,928 and $28,066 respectively, est. $32,468 and $27,204 respectively. H. E. Bailey, Oklahoma City, engr. Bids and awarded 11/14.

B. C., Britannia Beach — Howe Sound Mines Ltd., Britannia Beach, road from Herb Lake to Snow Lake mining area, day labor. $25,000.

EARTHWORK, WATERWAYS

PROPOSED WORK

Kan., Coffeyville—Approved $22,000 bond issue, levee work on Verdigris River. CD 10/4—ENR 10/12.

BIDS ASKED

Bids Asked December 5

Ia., Spencer—Bd. Supervs. Clay Co., at office County Auditor, clean-out, deepening 3.7 mi. open ditch in Drainage Dist. 2, involving approx. 60,000 cu. yd. excav.

Bids Asked December 8

Ill., Winchester—Big Swan Drainage & Levee Dist. at office of Secretary, furnishing, installing 55,000 gpm. Diesel driven pump unit incl. auxiliaries, station piping and foundns., pump. suction and discharge piping and changes to existing suction and discharge piping, at pump. station. Plans deposit $15. R. S. Coon, chn. Bd. Comrs.

Bids Asked December 19

Calif., San Dimas—Bd. Supervs. Los Angeles Co. Flood Control Dist., 751 S. Figueroa St., Los Angeles, Zone 14, revisions to spillway at Puddingstone Dam, near here. Over $25,000. Plans deposit $2.50. M. E. Salsbury, 751 S. Figueroa St., Los Angeles, engr.

Bids Asked January 3

†**Neb., Hemingford**—Bureau Reclamation, Dpt. Interior, H. W. Bashore, comr., Hemingford, earthwork and structures, Station 0 plus 00 to Station 692 plus 56, Main Canal, Mirage Flats Project, 12 to 22 mi. northeast of here, Spec. 1056.

LOW BIDDERS

†**Conn., New Haven**—U. S. Eng., 419 Industrial Trust Bldg., Providence, R. I., Nov. 17, dredging, maintenance work, New Haven Harbor, 45/6, from J. S. Packard Dredging Co., 1 Court St., Boston, Mass., $136,900. CD 11/9.

★†**N. M., Tucumcari**—Bureau Reclamation, Dpt. Interior, Tucumcari, Nov. 17, earthwork, Conchas Canal, Spec. 1051, Schedules 1, 2 and 3, from Morrison-Knudsen Co. Inc., P. O. Box 450, Boise, Idaho, $588,270. CD 10/31—ENR 11/2.

†**Nev., Nixon**—U. S. Indian Irrigation Service, 647 Phelan Bldg., San Francisco 2, Calif., Nov. 22, construction work in connection with Truckee River control project on Pyramid Lake Indian Reservation, from Miller & Stoutenberg, P.O. Box 37, Hawthorne, $25,074. CD 11/8.

†**Wash., Concrete**—U. S. Eng., 800 2 Ave., Seattle, Zone 4, Nov. 20, exploratory drilling at Faber dam site, near here, Neg. 1049, from Lynch Bros., 3635 Woodland Park Ave., Seattle, $18,750.

CONTRACTS AWARDED

Mass., Osterville—Wianno Club, Sea View Ave., repairing hurricane damaged sea wall, jetties for shore protection, to F. V. Lawrence, Main St., Falmouth, $52,000. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs.

†**Oregon**—U. S. Eng., 628 Pittock Block, S.W. 10 Ave. and Washington St., Portland, pressure testing and drilling 46 holes at Umatilla dam site, to Diamond Drill Contracting Co., S. 18 Stone St., Spokane, Wash., $53,850.

Que., Port Alfred—Saguenay Terminals, Ltd., 1700 Sun Life Bldg., Montreal, Que., dredging, to Marine Industries, Ltd., 1405 Peel St., Montreal, $40,000.

LATIN AMERICA

Brazil, Belem—Perfumarias Phebo, Ltd., Belem, plans phenol-formaldehyde plastic material mfg. plant for production of containers. $50,000.

★**Brazil, Rio de Janeiro**—Canadian Copper Refiners Ltd., Royal Bank Bldg., Toronto, Ont., plans copper sulfate plant. $500,000.

Brazil, Sao Paulo—Technical University of Sao Paulo, c/o Rev. R. Sabola de Madeiros, Society of Jesus, Sao Paulo, plans school of business administration and school of technical drawing bldg. $2,000,000.

British Guiana, Georgetown—Cuyuni Goldfields, Ltd., Whitehorse, Yukon, will construct mill and other essential buildings by day labor, under supervision of W. J. Asselstine, M.I.A.A., engr., 1149 Faithful St., Victoria, B. C. Est. $100,000.

B. W. I., Frome—Jamaica Government Subsidiary, c/o Colonial Secretary, Kingston, plans food yeast plant. $50,000.

B. W. I., Port Au Spain—Trinidad Govt., c/o Dpt. Agriculture, Port Au Spain, plans irrigation scheme in Caroni Co. $75,000.

Colombia, Bogota—Municipality, plans sewers. 300,000 pesos.

Colombia, Zipaquira—Instituto de Fomento Industrial, Zipaquira, plans sod compounds plant. $150,000.

Ecuador, Biblian—Republic of Ecuador, Quito, plans cement plant in Canar Province.

Mexico—Chihuahua State Government, Palacio del Estado, Chihuahua, plans eight 100 bed hospitals for workers and farmers in various cities. $435,000.

Mexico, Beristain — Cementos Anahuac, S. A. Cisda. de Chabacano, 84, Mexico, D. F., plans cement factory. $210,000. Work scheduled to start early in January.

Mexico, Lecheria—Goodyear Tire & Rubber Co., 1144 E. Market St., Akron, O., U. S. A., plans expanding truck tire mfg. plants and equipment. $1,319,845.

Mexico, Torreon—City, Palacio Municipal, plans 300 bed general hospital. $210,000.

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Bethpage, Long Island, New York

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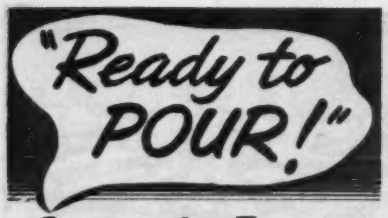

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LATIN AMERICA (Cont'd.)

Mexico—Chiapas State Government, Juan N. Esponda, governor, Palacio del Estado, Tuxtla Gutierrez, received loan from Banco Nacional Hipotecario y de Obras Publicas (National Urban Mortgage and Public Works Bank) to finance tap water installations in various towns. $1,150,000.

Mexico, Mexico City—Accesorios Electricos 1 de Mayo, 191 San Pedro de los Pinos, D. F., plans interruption switches factory. $125,000.

Mexico, Mexico City—Laboratories Lalomex S. A., Cuauhtemoc, 23, Atzcapotzalco, D. F., plans eucalyptus and eucalyptol essential oils factory. $200,000.

Mexico, Vera Cruz—Astilleros Unidos de Mexico San Juan de Letran, 24-501-02, Mexico, D. F., plans plant for manufacture of powered sea craft. $350,000.

Panama, Panama City—Bank of Urbanization and Rehabilitation, Panama City, plans slum area clearance and constructing modern dwellings. $2,500,000.

Panama, Puerto Armuelles—Compania Chiricana de Aviacion, David, plans airfield.

Paraguay, Asuncion—Continental Industrial Development Co., Asuncion, plans cold storage plant and grain silos. $250,000.

★**Paraguay, Asuncion**—Union Oil Co. of California, Asuncion, plans refinery and oil development in Chaco territory. $500,000.

Peru, Iquitos—Municipality, plans water supply and WW extens., $150,000; riverfront fmpvts. $100,000.

Venezuela, Caracas—Government, plans 7 rein-con. bridges on highway in states of Tachira and Barinas. $450,000.

PUBLIC BUILDINGS

PROPOSED WORK

†**Ariz., Flagstaff**—Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., San Francisco, Calif., 100 family dwelling units, Ariz. 2265.

†**Calif., El Toro**—Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., San Francisco, temporarily cancelled 150 family dwelling units, Calif. 4998-N. Over $150,000. Marsh, Smith & Powell, 816 W. 5 St., Los Angeles, archts. CD 11/1—ENR 11/9.

†**Calif., San Bernardino**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, 75 family trailers, Calif. 4908.

†**Conn., Bantam**—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., making plans water supply, fire protection, housing, Conn. 6082.

†**Colo., Denver**—U. S. Eng., 909 17 St., Denver, 1 story, 30x220 ft., permanent type neuro-phychiatric and social therapy bldg. $33,000.

†**Conn., Glastonbury**—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., grading, drainage, Conn. 6027 and 6028.

Conn., Rocky Hill—Comptroller, State Capitol, Hartford, plans by D. Orr, 96 Grove St., New Haven, nurses home.

†**Ga., Moultrie**—Bd. Comrs. Roads & Revenue Colquitt Co., C. G. Watson, chn., Moultrie, bids soon health center, Ga. 9-337. $31,000. **FWA.** E. Oren Smith, 11 W. 12 St., Columbus, archt.

†**Ill., Joliet**—Pub. Housing Auth., NHA, 201 N. Wells St., Chicago, making plans 1 story, 200 trailer unit, and 100 dormitory trailer units.

†**Ky., Bardstown**—Fairfield Distillery, Inc., Bardstown, addnl. plant bldgs. $160,000. Defense Plant Corp. will finance.

La., Shreveport — Pub. Housing Auth., NHA, 1205 Electric Bldg., 7 and Taylor Sts., Fort Worth 2, Tex., 150 family stop-gap units, La. 1(111.

†**La., Shreveport**—PLANT J. B. Beaird Steel Co., 4200 St. Vincent Ave., artillery shell mfg. plant. $300,000. Defense Plant Corp. will finance.

†**Me., South Portland (br. Portland)**—Pub. Housing Auth., NHA, 24 School St., Boston, Mass., making plans grading, constructing fences and log bumpers, war housing Me. 17019.

†**Mich., Detroit**—Pub. Housing Auth., NHA, 3073 E. 9 St., Cleveland, O., 410 unit temporary family dwellings, Mich. 20268.

†**Nev., Fallon**—Pub. Housing Auth., NHA, 785 Market St., San Francisco, Calif., 30 family stop-gap units, Nev. 26171, for Navy Dpt.

†**Nev., Hawthorne**—Pub. Housing Auth., NHA, 785 Market St., San Francisco, Calif., 150 unit stop-gap housing, Nev. 26170, for Navy Dpt.

†**N. J., Newark**—Pub. Housing Auth., NHA, 270 Bway., New York 7, N. Y., 135 family dwelling units, N. J. 2-10.

†**N. Y., Green Haven**—U. S. Eng., 120 Wall St., New York, Zone 5, bids soon recreation bldg. $73,000.

N. Y., Syracuse—Pub. Housing Auth., NHA, 270 Bway., New York, Zone 7, 75 unit single person housing (using Army barracks) N. Y. 30177.

†**N. Y., Youngstown**—U. S. Eng., 120 W... St., New York, Zone 5, preparing plans warehouse. $60,000.

O., Bay Village—Bay Village Bd. Edu... W. J. Springer, supt., Cahoon Rd., plans ... H. A. Fulton, 6014 Euclid Ave., Cleveland, 10 room school addn., and replacing heating plant at high school. $280,000. Bond issue approved. Will apply for FWA funds. C... 3/14—ENR 7/17.

O., Bowling Green—State, Dpt. P. Wks., C. Raschig, dir., Columbus, plans by Hahn & Hays, 723 Adams St., Toledo, 2 three-story, bsmnt., brick, steel, concrete dormitories for men. Total est. $150,000.

O., Columbus—Ohio State University, C. K. Steeb, bus. mgr., N. High St., plans by H. D. Smith, Brown Hall, brick, steel, concrete cyclotron laboratory. $50,000.

Okla., Oklahoma City—Oklahoma City University, 2501 N. Blackwelder St., sketches made science hall. $200,000.

Pa., Farview—State Dpt. Property & Supplies, Harrisburg, plans by Ballinger Co., 105 S. 12 St., Phila., fire alarm and emergency lighting sys., at Farview State Hospital. $25,000.

†**S. C., Orangeburg**—City, W. A. Cooper, asst. supt., bids soon nurses' home, S.C. 38-239. $117,000. **FWA.** J. B. Urquhart, Palmetto Bldg., Columbia, archt.

Tex., Fort Worth—American Mfg. Co., Hodge Station, Fort Worth, plans expans. imprvs. $275,000. Defense Plant Corp. will finance.

†**Tex., Pyote**—U. S. Eng., Albuquerque, N. M., two 105x124 ft. school bldgs., concrete frame, and exten. service lines, Job No. Pyote ESA 210-10. $150,000.

†**Va., Radford-Pulaski**—Pub. Housing Auth., NHA, Georgia Savings Bank Bldg., Peachtree and Broad Sts., Atlanta 3, Ga., 150 family portable shelter units, Va. 44139.

★**Va., Richmond**—Bd. Educ., 312 N. 9 St., plans by Marcellus Wright & Son, 1103 E. Main St., George Washington Carver Grade School. $660,000.

†**Wash., Steilacoom**—State Dpt. Finance, Olympia, plans by Mock & Morrison, Perkins Bldg., Tacoma, 2 story, part bsmnt., masonry, frame nurse's home at Western State Hospital, Wash. 45-317-N. $140,000. **FWA.** CD 11/8—ENR 11/16.

B. C., Saanich—Municipality, W. Greene, clk., Saanich, school. $191,770.

Ont., Barrie—Municipality, A. W. Smith, clk., Barrie, artificial ice making plant, $40,000. Ratepayers to vote Dec. 4.

Ont., Dunnville—Haldimand War Material Hospital, W. J. Appleyard, Dunnville, hospital. $150,000.

Ont., Hamilton—Bd. Educ., City Hall, 16 room school. $280,000.

Ont., Ottawa—Province of Ontario, Toronto, plans by Ontario Dpt. Planning, Parliament Bldg., Toronto, training and re-establishment centre. $150,000.

Ont., Sault Ste. Marie—City, community bldg. for artificial ice rink. $460,000.

Ont., Toronto—Municipality, plans bldg. to house 2 existing police stations, $150,000, remodeling city hall, $150,000.

Que., Knowlton—Public School Bd., J. W. Martin, secy., Knowlton, plans by Lawson & Little, 660 W. Ste. Catherine St., Montreal, 2 story, bsmnt., 80x185 ft., brick, rein.-con. high school, rein.-con. fdn. $165,000.

Que., Quebec City—Municipality, F. A. Chouinard, clk., plans City Hall annex, Chauveau Ave. $200,000; and central hygiene clinic $150,000. E. Hamel, City Hall, engr.

Sask., Regina—Province of Saskatchewan, Regina, fish filleting plant. $50,000. Dpt. Natural Resources, Regina, engr.

Sask., Regina—Province of Saskatchewan, Regina, pulp mill in northeast timber region of province. $300,000. Dpt. Natural Resources, Parliament Bldg., engr.

Sask., Saskatoon—Collegiate Bd., Saskatoon, plans Memorial Library. $150,000.

BIDS ASKED

Bids Asked About December 4

N. S., Shelburne—Secy. Dpt. Munitions & Supply, Ottawa, Ont., Foundry Bldg. 44, at Naval Base, for Dpt. National Defense for Sea, Ottawa, Ont. $45,000.

Bids Asked December 6

†**La., Lake Charles**—Supt. Schools Calcasieu Parish, Court House Bldg., 4 classroom addn. Maplewood School, in Maplewood Housing, about 7 mi. west of ben. Project La. 16-250-F.A. **FWA.** Plans deposit $10.

Bids Asked December 8

†**Mich., Inkster**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., 1 story, 11 classroom, school, Mich. 20-264. **FWA.** Eberle M. Smith Associates, 208 Murphy Bldg., Detroit, Zone 3, archts. CD 11/1—ENR 11/16.

Bids Asked December 13

†**Mich., Wayne**—Pub. Bldgs. Admin., 18 and F Sts. N.W., Wash. 25, D. C., recreation bldg., Mich. 20-335. **FWA.** CD 9/7—ENR 9/14.

†**Va., Newport News**—Newport News General and Non-Sectarian Hospital Assn., Inc., Newport News, nurses home addn. Riverside Hospital, Va. 44-421. **FWA.** Williams, Colle & Piping, 403 Nelson Bldg., archts.-engrs. CD 10/4—ENR 10/12.

PUBLIC BLDGS. (Bids Asked, Cont'd.)

Bids Asked December 14

†Calif., Bellflower—Pub. Bldgs. Admin., 18 and F Sts., N. W., Wash. 25, D. C., 18 classroom school consisting of seven 1 story wood frame bldgs., Calif. 4-611. FWA. Extended date. Kistner & Wright, Architects Bldgs., Los Angeles, archt. CD 10/25—ENR 11/2.

†Tex., Pasadena—Bd. Educ., c/o T. Jan-, Pasadena, 4 room addn. to Cruse School; 10 classroom bldg.; cafeteria bldg., band house; bus station and garage, etc., Tex. 41-704-N. $300,000. FWA. Hedrick & Lindsley, 811 Southern Standard Bldg., Houston, archts. CD 11/6—ENR 11/9.

Bids Asked After December 15

†N. C., Raleigh—State Hospital, Dix Hill, nurses' home at Dix Hill Hospital for Insane, N.C. 31-293-N. $105,000. FWA. Northrup & O'Brien, Winston Salem, archts. CD 11/8—ENR 11/16.

Bids Asked December 19

†Calif., Inyokern—Pub. Bldgs. Admin., 18 and F Sts. N. W., Wash. 25, D. C., 2 story, 79x33 ft. recreation bldg., Calif. 4-651. FWA. CD 9/7—ENR 9/14.

Bids Asked December 20

†Tenn., Tullahoma—City, D. B. Campbell, mayor, 2 story, bsmnt., brick hospital, Tenn. 40-190. FWA. Warfield & Keeble, Nashville Trust Bldg., Nashville, archts. CD 7/31—ENR 8/3.

Bids Asked December 23

Conn., Rocky Hill—State Comptroller's Office, State Capital, Hartford, brick, steel hospital infirmary unit addn., U. S. Veterans' Home. $150,000. D. Orr, 96 Grove St., New Haven, archt.

Bids Asked December 30

†Mont., Billings—St. Vincent's Hospital, Billings, nurses' training bldg., Mont. 24-114-N. $249,910. FWA. J. G. Link & Co., Electric Bldg., Billings, archt. CD 10/13—ENR 10/19.

Bids Asked January 9

†Mich., Dearborn—Veterans Admin., Vermont Ave. between H and I Sts. N.W., Wash. 25, D. C., addnl. bldgs., utilities. Proj. 2073.

Bids Asked January 11

La., Bogalusa—M. J. Israel, secy.-treas. School Bd., High School Bldg., 1 story, 185x210 ft., brick Central School. Plans deposit $40. W. R. Burk, 501 Pan-American Bldg., New Orleans, archt. CD 3-1—ENR 3/3.

Bids Asked January 16

†Mont., Missoula—St. Patrick's Hospital, Sisters of Charity, Missoula, nurses' training bldg., Mont. 24-115-N. $307,234. FWA. H. E. Kirkemo, Missoula, archt. CD 10/13—ENR 10/19.

Bids Asked

†Mass., Fort Devens—U. S. Eng., 31 St. James Ave., Boston (selected list bidders), bldgs., installing plumbing and heating sys., No. 19-023-45-Neg-55. $14,000.

★†Tex., Karnack—Monsanto Chemical Co., 1700 S. 2 St., St. Louis 4, Mo., increasing capacity of Longhorn Army Ordnance plant. $7,500,000. Defense Plant Corp. will finance. CD 11/14—ENR 11/16.

†Wis., Merrimac—Federal Works Agency, 20 N. Wacker Dr., Chicago, Ill., 1 story, 56x234 and 56x68 ft. concrete, concrete block addn. to grade nursery school, at Badger Ordnance Works, Wis. 47-149 F. $90,000. L. Sibora, 108 W. Mifflin St., Madison, archt.

LOW BIDDERS

†Calif., Berkeley—Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., San Francisco, 192 war dwelling units, Calif. 4916-N, from G. W. Williams Co., 10 California Dr., Burlingame. $433,870. CD 10/20—ENR 10/26.

★†Calif., Oceanside—Pub. Housing Auth., NHA, 3100 Linda Vista Rd., San Diego, Nov. 24, 450 family dwelling units, Calif. 4900-N, from Shumaker & Evans Constr. Co., 316 W. 5 St., Los Angeles, $1,374,382. CD 11/15.

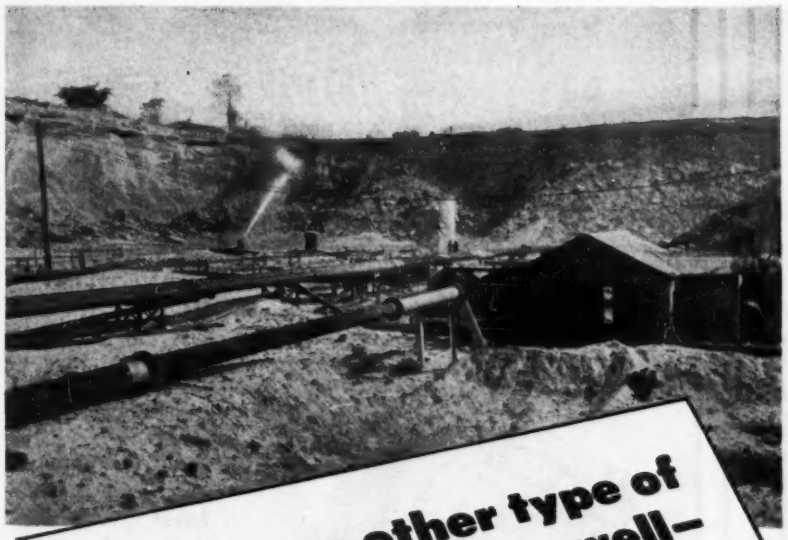
†Calif., Oxnard—Pub. Housing Auth., NHA, 760 Market St., San Francisco, Nov. 24, 43 bldgs., containing 172 war dwelling units and community bldg., Ventura and Mooley Rds., Calif. 4897-N, from Jensen & Jepsen, 1540 S. Robertson Blvd., Los Angeles, $472,595. Soule & Murphy, 116 E. Sola St., Santa Barbara, archts. CD 10/4—ENR 10/12.

★†Calif., Pacific Beach (sta. San Diego)—Pub. Housing Auth., NHA, 3100 Linda Vista Rd., Nov. 21, 225 family war dwelling units, Calif. 4914-N, from Harvey & Rose, 211 W. Orange Grove Ave., Arcadia, $698,-388. CD 10/24—ENR 10/26, under San Diego.

†Calif., San Diego—Pub. Housing Auth., NHA, 760 Market St., San Francisco, Nov. 21, 100 family dwelling units, Calif. 4902-N, from Wm. C. Crowell Co., 170 E. California St., Pasadena, $371,100. CD 10/24—ENR 10/26.

★†Calif., San Diego—Pub. Housing Auth., NHA, 2100 Linda Vista Rd., Nov. 22, 250 family dwelling units, Calif. 4915-N, from Wm. C. Crowell Co., 170 E. California St., Pasadena, $1,099,000. CD 11/15.

★†Calif., San Diego—Pub. Housing Auth., NHA, 3100 Linda Vista Rd., Nov. 21, 31 bldgs., containing 248 family dwelling units, Calif. 4901-N, from Wm. C. Crowell, 170 E. California St., Pasadena, $782,000. CD 11/8.



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PUBLIC BLDGS. (Low Bidders, Cont'd.)

†**Calif., San Pedro**—Pub. Housing Auth., NHA, 816 W. 5 St., Los Angeles, Nov. 21, 32 bldgs., containing 88 war dwelling units, on Elamita Dr. near Western Ave., from Geo. B. Thatcher, 4074 Laurel Canyon Blvd., North Hollywood, $299,462. R. C. Flewelling, 816 W. 5 St., Los Angeles, and K. S. Wing, 501 Termino Ave., Long Beach, archts.

†**Calif., Santa Ana**—Pub. Housing Auth., NHA, 760 Market St., San Francisco, Nov. 17, 75 family dwelling units, Calif. 4912-N, from Donaldson Constr. Co., 727 W. 7 St., Los Angeles, $225,963. CD 11/1—ENR 11/2.

Ill., Chicago—Chicago Housing Auth., 343 S. Dearborn St., Nov. 13, 1 story, brick, concrete boiler plant addn., from C. E. Carlson Co., 601 N. St. Clair St., $158,880. CD 11/2.

Ind., Peru—Bd. P. Wks., J. O. Miller, mayor, chn., Marjorie Blue, clk., City Hall, Nov. 21, 1 story, 67x75 ft., brick, rein.-con., structural steel municipal power plant addn., imprvs., from J. C. Burke, 206 Grant St., $97,722***450 lb. bent tube boiler, from Babcock & Wilcox, 140 S. Dearborn St., Chicago, Ill., $179,968***turbine, from General Electric Co., 326 W. Georgia St., Indianapolis, $226,380. CD 10/30—ENR 11/2.

La., Monroe—City, City Hall, Contr. 10, structures in connection with power plant imprvs., from Harmon Constr. Co., 1116 N. W. 4 St., Oklahoma City, Okla., $158,000. CD 10/26—ENR 11/2.

†**Md., Aberdeen**—U. S. Eng., Standard Oil Bldg., Baltimore, Nov. 14, constant temperature magazines, from National Structures Corp., 804 Kennedy St., Wash., D. C., $88,453.

†**Pennsylvania**—Allegheny County Housing Auth., 201 County Office Bldg., Pittsburgh, site imprvs., for Sheldon Park Housing 36241, Harrison Twp., for NHA, from Boquet Const. Co., 3622 Old Boston Rd., Pittsburgh, $64,536. CD 4/7—ENR 4/13.

†**Pa., Dravosburg**—Pub. Housing Auth., NHA, 270 Bway., New York 7, N. Y., site imprvs., addnl. opening to crawl spaces by cutting existing walls and necessary shoring, drainage gutters, yard drains, storm sewer, repair concrete walks and steps, guard rails, regrading, planting, etc., from Boquet Const. Co., 3622 Old Boston Rd., Pittsburgh, $75,700. CD 1/14—1/20.

†**Wash., Seattle**—Pub. Housing Auth., NHA, Skinner Bldg., 5 Ave. and Union St., Zone 1, Nov. 15, 130 unit housing, Magnolia Bluff Dist., Wash., 45280 N, from Nettleton & Baldwin, 1109 N. 36 St., $384,900. CD 10/17—ENR 10/19.

†**Wis., Baraboo**—Baraboo Hospital Assn., Occ. Sisters St. Marys, Inc., Baraboo, Nov. 21, general contract hospital addn., Wis. 47-132-N, from Hron Bros. Co., Inc., 213 W. Main St., West Bend, $173,743; heating and plumbing, from Pharo Htg. Co., Inc., 1302 Regent St., Madison, $39,271. CD 11/8—ENR 11/16.

CONTRACTS AWARDED

★†**Calif., Los Angeles**—Queen of Angels Hospital, 2301 Bellevue Ave., 8 story hospital addn., Calif. 4-626-N, to J. E. Haddock, Ltd., 2338 E. Foothill Blvd., Pasadena, $625,300. Est. $607,495. FWA. CD 11/17—ENR 11/23, under LB.

†**Calif., San Bernardino**—U. S. Eng., 751 S. Figueroa St., Los Angeles, Zone 14, 2 salvage warehouses, appurtenant facilities at Quartermaster Repair Sub Depot, to Meade & O'Donnell, 7769 Melrose Ave., Los Angeles, $54,339. Bids 10/23, awarded 11/17.

★†**Calif., Stockton**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., administration and operational bldgs. at Naval Supply Depot, on Rough and Ready Island, Spec. 15074, NOY 10639, to Twaits, Morrison & Knudsen and Ben C. Gerwick, Inc., 391 Sutter St., San Francisco, $1,577,000. CD 11/21, under LB.

★†**Calif., Vallejo**—Pub. Housing Auth., NHA, Phelan Bldg., 760 Market St., San Francisco, 350 family dwelling units on Sears Point Rd., Calif. 4912-N, to Moore & Roberts, 693 Mission St., San Francisco, $682,145. CD 11/24, under LB.

†**Kan., De Soto**—U. S. Eng., 10 E. 17 St., Kansas City, Mo., wood framing and structural concrete work at Sunflower Ordnance works, to Olson Const. Co., 410 S. 7 St., Lincoln, Neb., $222,492. Bids after 11/11. CD 11/14—ENR 11/16.

†**N. J., Edgewater**—Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N.W., Wash. 25, D. C., repairs, Naval Material Redistribution Center, NOY 10794, to W. J. Barney Corp., 101 Park Ave., New York 17, N. Y. $76,935.

†**Ore., Klamath Falls**—Pub. Housing Auth., NHA, Skinner Bldg., Seattle, Zone 1, Wash., 80 unit housing, Ore. 35303 R, to K. T. Henderson, Longview, Wash., $244,577. Bids 11/20. CD 11/19—ENR 10/26.

†**Pa., Chambersburg**—U. S. Eng., Standard Oil Bldg., Baltimore, Md., altering warehouse, to R. S. Noonan, Inc., York, $45,688; sewage disposal plant addns., to Walker Bros., Chambersburg, $40,000, both at Letterkenny Ordnance plant, near here. Awarded 11/17 and 18 respectively.

†**Pa., Johnstown**—U. S. Eng., Standard Oil Bldg., Baltimore, Md., constructing hydraulic sys. Johnstown Forging Plant. Contr. W-18-020-Eng-698, to Pittsburgh Piping & Equipment Co., 43 St. and A. V. R. R., Pittsburgh, $34,190.

PUBLIC BLDGS. (Contracts Awarded, Cont'd.)

†Pa., Lebanon—Veterans Admin., Vermont Ave. between H and I Sts. N.W., D. C., general contract hospital, Wash. 25, to John A. Johnson Contracting Corp., 265 41 St., Brooklyn 41, N. Y., $2,504,001*** water tank to Chicago Bridge & Iron Co., Bowen Bldg., Wash., D. C., $31,875*** elevators to Westinghouse Electric Elevator Co., 17 Academy St., Jersey City, N. J., $25,900. Grand total $2,611,126. Bids 11/21. CD 11/24, under LB—ENR 11/2.

†Tex., McGregor—U. S. Eng., 25 St. and Avenue G, Galveston, addnl. bldgs., Supplemental Agreement 4 for Bluebonnet Ordnance Plant, to James T. Taylor, First National Bank Bldg., Fort Worth, $146,925.

†Wash., Wenatchee—Bonneville Power Admin., P. O. Box 2537, Portland, Ore., rein.-con. control and oil houses at Columbia Switching Station, near Rock Island, Inv. 2454 to D. J. Malarkey, 9238 S. W. 17 St., Portland, Ore., $69,732. Bids 11/9, CD 10/30—ENR 11/2.

COMMERCIAL BUILDINGS

PROPOSED WORK

Del., Wilmington—St. Elizabeth's Roman Catholic Church, Rev. J. N. Grant, pastor, Broom and Oak Sts., rejected bids Oct. 31, church. $150,000-$250,000. Will revise plans. Gleeson & Mulrooney, 1612 Market St., archts. CD 11/9—ENR 11/16 under LB.

D. C., Wash.—St. Anns Roman Catholic Church, 4400 Wisconsin Ave. N.W., plans by H. D. Dagit & Son, 1329 Race St., Phila., Pa., 2 story, bamnt., stone church, and 1 story stone rectory. $225,000.

★Ill., Chicago—Continental Hotel, c/o J. Mack, Croydon Hotel, 616 N. Rush St., sketches by Holabird & Root, 333 N. Michigan Ave., altering 42 story Medinah Club Bldg. into 800 room hotel. $1,000,000.

Ill., Highland Park—Highland Park Hospital, Highland Park, sketches by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, 1 story, brick, concrete, steel hospital addn. $225,000.

Ill., River Forest—John Cummings Lindop, 430 N. Harlem St., plans completed by C. J. Kastrup, 7346 Madison St., Forest Park, 3 story, 165 x 200 ft., brick apartment, Bonnie Brae and Lake Sts. $175,000.

Pa., Camp Hill—L. B. Smith, 28 North 2d St., plans by G. Frank Witman, 36 E. Market St., York, brick, stone, cement and concrete shopping center and theatre. $150,000.

Pa., Carlisle—B. H. Snyder, R. D. 5, Carlisle, plans completed, 50 residences. $225,000.

★Pa., Doylestown—Owner, c/o G. S. Idell, archt., 1510 Chestnut St., Phila., making plans, 400 two story, single family unit homes in Bucks Co., near Budd Aviation Plant. $2,200,000. FHA.

Pa., Harrisburg—Penn-Roosevelt, Inc., c/o A. G. Kelly, Radnor St., one hundred two story, brick dwellings. Over $150,000.

Tenn., Memphis—Collins Chapel Connectional Hospital, 418 Ashland and Lane Sts., plans by McKissack & McKissack, Morris Memorial Bldg., Nashville, hospital imprvs. $150,000. CD 8/31/43—ENR 9/2/43.

Tex., McAllen—McAllen Home Building, Inc., 309 N. 3 St., soon lets contract forty story, frame dwellings. CD 11/15—ENR 11/23.

★Wis., Racine—St. Lukes Hospital, 1301 College Ave., sketches by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Ill., 3 story, brick, concrete, steel hospital addn. $600,000.

Alta., Banff—Reverend Sisters of Ste. Martha, Antigonish, N. S., plans by E. J. Turcotte, 1010 W. Ste. Catherine St., Montreal, Que., hospital. $900,000.

★Ont., Kitchener—K-W Hospital Comn., c/o C. N. Weber, secy., 66 S. Queen St., receiving competitive plans for hospital. $500,000.

Ont., North Toronto (Postal Dist. Toronto)—Y.M.C.A., 21 Dundas Sq., Toronto, YMCA Bldg. $150,000.

★Ont., Toronto—N. H. Knowles Const. Co., Ltd., 414 Bay St., plans model suburban community, incl. 515 houses, on property known as York Terrace, North York Twp. Est. about $1,500,000 for houses only. Also plans construction of stores, roads, water and sewerage sys., beautification scheme, incl. landscaping.

Ont., Toronto—Ontario Woodsworth Memorial Foundation, c/o R. J. Gee, 244 Goldhawk Rd., educational institution for teaching social sciences, economics and philosophy. $150,000.

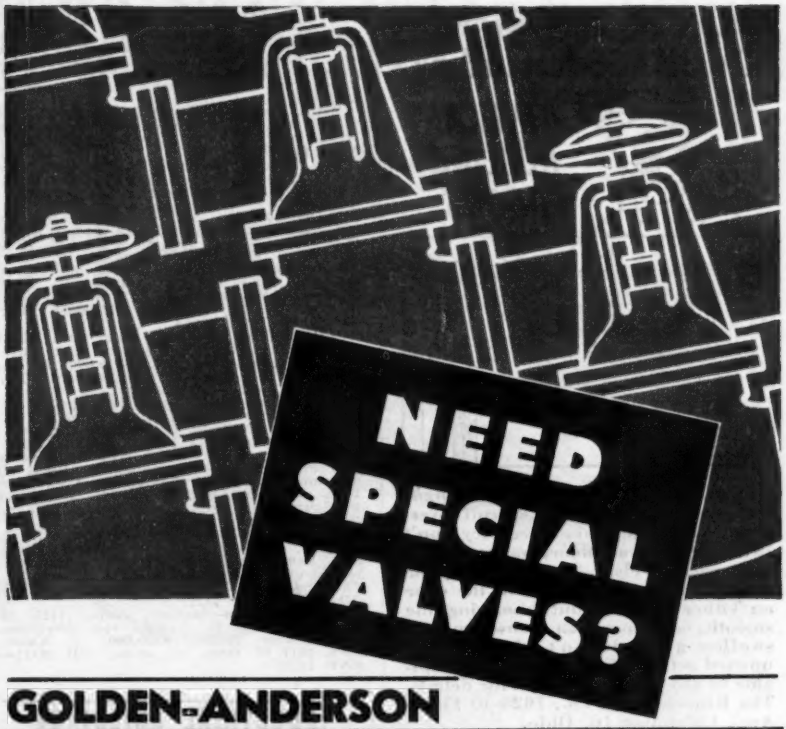
Que., Quebec City—Laval University, Rev. Msgr. C. Gagnon, 17 Ste. Famille St., bldg. for Institute of Hygiene and reconstructing School of Medicine bldg., University St. $50,000.

BIDS ASKED

Tex., Galena Park—E. Middleton, Galena Park, 100x296 ft. concrete, etc., stores bldg. $50,000. Hedrick & Lindsley, 311 S. Std. Bldg., Houston, archts.

CONTRACTS AWARDED

Calif., Bakersfield—Stevenson Co., 10469 Wilkens Ave., Los Angeles, forty-six 2 bedroom frame, stucco dwellings, Owner builds. Approx. $175,000. Chandler & Smallwood, 311 Beverly Blvd., Los Angeles, engrs.



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COMMERCIAL BLDGS. (Cont'd.)

Calif., San Clemente, Paso Robles and El Centro—Smith-Taylor Co., 157 Linden Ave., Long Beach, 8 dwellings at San Clemente, 23 at Paso Robles and 20 at El Centro, all frame, stucco. Owner builds. $386,000.

Calif., Seal Beach—Norton & Bailey, 710 Ocean Ave., 50 stucco dwellings at scattered locations, to G. Bailey, 710 Ocean Ave., $250,000.

Ill., Peoria Heights—Pershings Homes, Inc., Knoxville Ave., Peoria, 50 brick, single family permanent houses, Prospect Rd., to T. S. Willis, Janesville, Wis. Est. $250,000-$300,000. J. Fletcher Lankton & Associates, Beverley Theatre Bldg., Knoxville Ave., Peoria, archts. CD 10/4—ENR 10/12.

Ind., Anderson—South Anderson Imprvt. Co., 3705 Main St., 75 dwellings, to J. B. Snyder & Sons Constr. Co., 114 South Franklin St., Muncie, approx. $425,000. FHA. CD 10/12—ENR 10/19.

Md., Baltimore—Food Fair, Inc., 2515 Greenmount Ave., brick, store and warehouse, separate contracts. $150,000. L. Kasoff, 223 E. Allegheny Ave., Phila., Pa., archt. CD 4/20—ENR 4/27.

★**O., Akron**—Westwood Manor, Inc., Westwood Manor Gardens, Inc., and Westwood Manor Village, Inc., E. Lotery, pres., 80 Maiden Lane, New York 7, N. Y., twenty-two 2 story, brick garden type apartments containing 341 living units, to Psaty & Fuhrman, Inc., 369 Lexington Ave., New York 17, N. Y. Est. $1,500,000. McMurray & Schmidlin, Professional Bldg., Union, N. J., archts.

Pa., Enola—Pennsylvania R.R., J. L. Gressitt, ch. engr., Broad St. Station Bldg., 1617 Pennsylvania Blvd., Phila., domitory, to Murphy Quigly & Co., 1518 Sansom St., Phila., $240,000. Bids 11/6, awarded 11/13. CD 10/30—ENR 11/2.

Tex., Houston—Mensco Corp., 4415 N. Roseneath St., 30 frame type dwellings, etc. Owner builds. $150,000. J. Knostman, 2017 W. Gray St., archt. CD 10/31—ENR 11/2.

INDUSTRIAL BUILDINGS

PROPOSED WORK

Conn., Derby—FACTORY—Sponge Rubber Products Co., Howe Ave., soon lets contract, brick, steel factory addn. $75,000. L. F. Caproni, 1221 Chapel St., New Haven, engr. CD 10/30—ENR 11/2.

Conn., East Hartford—BAKERY—Regan Bakeries, 1022 Main St., plans by Kane & Fairchild, 49 Pearl St., Hartford, brick, steel bakery, incl. retail store, cafeteria and storage. $50,000.

Conn., Hartford—WAREHOUSE-GARAGE—Roberts, Steele & Dolan Co., Inc., 726 Windsor St., soon lets contract brick, steel warehouse-garage addn., incl. freezer dpt. and office addn. $45,000. Mylchreest & Reynolds, 238 Palm St., engrs.

Conn., Stratford—FACTORY—Baird Machine Co., 1700 Stratford Ave., soon lets contract, 1 story, 70x125 ft., brick, steel factory addn. Fletcher Thompson, Inc., 211 State St., Bridgeport, engr.

★**Ill., Cicero** — REPAIR SHOP — Chicago, Burlington & Quincy R.R. Co., H. R. Clarke, ch. engr., 547 W. Jackson Blvd., Chicago, Zone 6, soon lets contract, 1 story, brick, concrete, glass block, structural steel repair shop, concrete fdn. $500,000.

Mass., Boston—PLANT—New York, New Haven & Hartford R.R. Co., E. E. Oviatt, ch. engr., Yellow Bldg., Water St., New Haven, Conn., soon lets contract brick diesel locomotive plant, Dover St.

Mass., Brighton—GARAGE—Diamont T Sales & Service Corp., 10 Glenville Terrace, Allston, Boston, plans by Perry, Shaw & Hepburn, Park Square Bldg., Boston, 1 story, 75x220 ft., brick, steel garage, Beacon St. $40,000.

★**Minn., Brainerd**—REPAIR SHOPS, etc.—Northern Pacific Ry. Co., B. Blum, ch. engr., 176 E. 5 St., St. Paul, brick, steel, rein.-con. car repair shops. $1,000,000.

Minn., St. Paul—BOILER HOUSE—Griggs, Cooper & Co., 1821 University Ave., brick, concrete boiler house. $40,000. Steam plant to Fuel Economy Engrg. Co., 509 New York Bldg.

Mo., St. Louis—PLANT—Roehr Diartibuting Co., 2720 Locust St., Zone 8, plans by E. L. Lawler, 3672 Hickory St., Zone 10, 2 story, bsmnt., concrete, building glass and glass brick distributing plant, on 50 x 130 ft. site, 2718 Locust St. $40,000 with equip.

North Carolina and Virginia—GARAGES—Carolina Coach Co., 1201 S. Blount St., Raleigh, N. C., soon lets contract, two 71x180 ft., bus garages, Jacksonville, N. C. and Norfolk, Va. J. M. Edwards, Insurance Bldg., Raleigh, N. C., archt.

N. J., Millburn—STORAGE, etc.—Rimback Storage Co., 385 Millburn Ave., 3 story storage warehouse. $42,000.

N. J., Springfield—KETTLE HOUSE—Carter Bell Mfg. Co., Morris Ave., plans by G. D. Hayes, 566 Westfield Ave., Westfield, 1 story, cinder block kettle house. $40000.

N. Y., Mechanicville—PLANT—Boston & Maine R.R. Co., T. G. Sughrue, ch. engr., 150 Causeway, Boston, Mass., soon lets contract, brick plant, locomotive water treatment facilities. CD 7/14—ENR 7/20.

O., Girard—FACTORY, etc.—General Paint Corp., Hill, Hubbell & Co., Div. M. M. Bowen, div. mgr., 3091 Mayfield Rd., soon lets contract concrete block, steel factory and storage bldg. $276,000.

O., Marietta — SHOP — Marietta Dyestuffs Co., Marietta, shop. $75,000.

O., Martins Ferry—FACTORY—Wheeling Steel Corp., Wheeling Steel Corp., Bldg., Wheeling, W. Va., repairing factory bldg. $50,000.

Pa., Lebanon—MILL—Lebanon Steel Co., c/o P. Repino, plant engr., Lebanon, plans mill. $250,000.

Pa., McKeesport — FACTORY — National Tube Co., Frick Bldg., Pittsburgh, factory addn., alterations. $56,000.

Pa., New Kensington — PLANT IMPROVEMENTS—Aluminum Co. of America, New Kensington, plans revising bldg., roof, installing heaters and fabricate air ducts of sheet metal, $59,700; also replacing roof and side walls of factory, $39,050.

Pa., Pittsburgh—FACTORY—Atlas Equipment Corp., 722 Oliver Bldg., factory. $75,000.

Tex., Fargo—PUMPING STATION—Bell-Western Corp., Wichita Falls, pump. station on crude oil pipeline, $75,000. 5 acre bldg. site purchased.

Tex., Houston—PLANT—Southern Warehouse Corp., M. M. Feld, pres., 4410 Clinton St., plans nearing completion by Finger & Rusty, National Standard Bldg., rice drying plant, steel and corrugated iron. $200,000. CD 10/18—ENR 10/26.

Tex., Houston — BOTTLING PLANT — Vernor's Ginger Ale Co. of Houston, Inc., 4906 Harrisburg Blvd., Houston, bottling plant imprvs., expans. $40,000.

Tex., Rockwall—WAREHOUSE—M. B. Shook, Rockwall, reconstructing cotton storage warehouse. $40,000.

Tex., San Antonio — STORAGE — H. E. Butt Super-Markets, 4915 Bway., large cold storage and storage bldg. $40,000.

★**Sask., Saskatoon**—PLANT—Saskatchewan Co-operative Wheat Producers, Ltd., J. W. Wesson, pres., Wheat Pool Bldg., Albert St., Regina, plans 2,000 bu. per day wheat plant to produce glycol, 2 expeller vegetable oil plant, flour milling plant for processing all gains, grain handling and storage facilities to handle flax, wheat, and other grains, starch plant to convert starch into glucose, feed mixing plant and warehouse. $2,500,000. C. D. Howe Co. Ltd., 712 Utilities Bldg., Port Arthur, Ont., engrs.

★**West Virginia**—PLANT—Goodyear Tire & Rubber Co., E. Market St., Akron, O., Vinyl chloride copolycerm producing plant, at Natrium, Marshall Co. $1,460,000.

W. Va., Fairmount—FACTORY—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., altering factory. $251,000.

Wis., Bloomer—MILK PLANT—Chippewa County Co-Operative Dairy, Bloomer, plans by Klinger, Hubbard & Gohn, engrs.-archts., 218 S. Barstow St., Eau Claire, 1 story, bsmnt., 70x100 ft. milk plant, brick, tile, concrete fdn.

Wis., Colfax—CREAMERY—Colfax Cooperative Creamery Co., Colfax, plans by Klinger, Hubbard & Gohn, engrs.-archts., 218 S. Barstow St., Eau Claire, 3 story, bsmnt., 56x116 ft. creamery addn., brick, tile, concrete fdn.

Wis., Eau Claire—FOUNDRY—White Machine Wks., 750 Wisconsin St., 100x145 ft., half 2nd story, ¼-3 story foundry bldg. and 3 story, 36x40 ft. pattern room bldg. $300,000.

Ont., Mornington—PLANT—Newton Woolen Mills Ltd., Mornington, plant for manufacturing woolen goods and by-products.

Ont., Owen Sound—PLANT—Noma Electric Co. of Canada, Ltd., L. Czell, mgr., Noma Elec. Corp., 55 W. 13 St., New York, N. Y., altering bldg. $200,000.

Ont., Preston—FACTORY—Transport Appliances, Preston, plans by W. H. B. Schmalz, 120 King St. W., Kitchener, factory addn. $40,000.

Ont., Tillsonburg — FACTORY — Summerhayes Co. Ltd., 7 Brantford Ave., factory, Ralph St. About $45,000.

Ont., Toronto—PLANT—H. Heaton Printing House Ltd., 431 W. King St., printing, etc. plant. $50,000.

Ont., Toronto—PLANT—Booster Nut Co. Ltd., c/o S. D. Ellis, 21 Dundas Sq., confectionery, biscuit, nuts, etc. mfg. plant. $40,000.

Que., St. Emile—FACTORY—P. A. Alain, St. Emile, footwear factory. $40,000.

Que., St. Leon—PLANT—Saline Inc., St. Leon, bottling plant and mfg. aerated and mineral waters, other beverages. $40,000.

Que, St Michel (Postal Dist Montreal)—COLD STORAGE—J. B. Auclair Ltd., 322 Beaubien St., Montreal, cold storage plant. $50,000.

Que., Ste. Therese—PLANT—Cotton Wool Products Ltd., St. Therese, plans by Luks & Little, 1410 Guy St., Montreal, 1 story, 80x180 ft., rein.-con. furniture mfg. plant.

Que., Thetford Mines—FACTORY—La Cie C. D. J. Ltd. de Thetford Mines, Thetford Mines, factory.

Sask., Outlook—GRAIN ELEVATOR—Co-Operative Producers Ltd., Outlook, grain elevator. $40,000.

INDUSTRIAL BLDGS. (Cont'd.)

BIDS ASKED

Bids Asked After December 1

Tex., Freeport—STORAGE—Dow Chemical Co., Freeport, and M & M Bldg., Houston, high-pressure steel storage. $80,000. CD 11/24.

Tex., Katy—PLANT—Dow Chemical Co., M & M Bldg., Houston, and Freeport, meter-ing, filter bldg., facilities, $50,000. CD 11/24.

Bids Asked December 11

Tex., Rosebud—FROZEN FOOD LOCKER AND PROCESSING PLANT—T. C. Kirsey, Rosebud, frozen food locker and processing plant. Thos. D. Broad, Burt Bldg., archt. Paul G. Bentley, 407 Burt Bldg., Dallas, engr. CD 11/22.

Bids Asked After January 1

Md., Hagerstown—PACKING PLANT, etc. American Fruit Growers, Inc., G. S. L. Carpenter, mgr., Professional Arts Bldg., packing, office, display, cold storage bldgs. on 12 acre tract. $350,000-$450,000. Simon & Simon, 123 S. Broad St., Phila., Pa., archts. C. H. Wolf, 112 S. 16 St., Phila., Pa., engr.

Bids Asked

La., Baton Rouge — PLANT — General Chemical Co., 40 Rector St., New York, N. Y., anhydrous hydrofluoric acid plant. $700,000. CD 11/8—ENR 11/16.

Me., Auburn—PLANT—F. W. Winter, 29 Pine St., altering 4 story bldg. for public re-frigeration plant, etc. $110,000. CD 5/17—ENR 5/25.

O., Cleveland — FACTORY — A. E. Rowe, Mgr., 1949 Euclid Ave., 60 x 220 ft., brick, steel factory addn., for Triplex Screw Co., E. Weber, pres.-genl. mgr., 5817 Grant Ave. $50,000.

Tex., Amarillo—COMPRESSOR STATION West Texas Gas Co., Lubbock, compressor station unit. $40,000. CD 7/3—ENR 7/6.

Tex., Houston — PLANT — Nyotex Chemicals, Inc., Mellie Esperson Bldg., plant organ. $485,000. CD 11/8—ENR 11/16 .

Ont., Toronto—PLANT—W. L. Ballentine Co. Ltd., 380 W. Fleet St., 2 story, 60x60 ft. and 40x70 ft., brick, steel, plant addns., concrete fdn. $50,000. Margison & Babcock, 707 New Wellington Bldg., engrs. CD 5/9.

CONTRACTS AWARDED

Ark., Little Rock—FACTORY—United States Times Corp., Waterbury, Conn., alarm clock factory, to G. W. May Constr. Co., 501 Asher St., $54,575.

Calif., Burbank—SHOP ASSEMBLY AND STORAGE—Walt Disney Productions, 2400 W. Alameda Ave., 110x120 ft., steel stucco shop assembly and storage bldg. Owner builds. Approx. $50,000. J. Lill, 2409 W. Alameda Ave., engr.

Calif., Los Angeles — PLANT — Sterling Meat Co., 2501 E. Vernon Ave., reconstruct-ing meat packing plant. Owner builds. $7,500.

Conn., New London—DAIRY—New London & Mohegan Dairies, Inc., 75 Jefferson Ave., 1 story, 75x90 ft. dairy, brick, con-crete, to Mondelci & Benvenutti, 225 Colman St., $55,000. Payne & Keefe, 231 State St., archts. Bids 10/20. CD 10/18—ENR 10/26.

Ga., Commerce—MILL—Harmony Grove Mills, Commerce, cotton mill addn., rein.-con. structural steel to Fennell Constr. Co., Gainesville, $43,379. Bids 11/7. J. E. Sirrine Co., Greenville, S. C., engr.

Ill., Chicago—FACTORY—Monarch Silver Mfg. 1240 N. Homan St., masonry contract 1 story, 151x208 ft., brick factory, to J. R. Johnson, 4053 N. St. Louis St.; carpentry, to Emil Anderson, 1809 Balmoral St. Est. $75,000. Engineering Systems, Inc., 221 N. LaSalle St., archts.

Ill., Chicago—FREIGHT TERMINAL, Inc.—Motor Express, Inc., 141 W Jackson Blvd., 1 story, brick freight terminal and garage, to A. B. Larson, 3833 W. Lake St. Est. $280,000. M. L. Pereira, 100 W. Monroe St., archt.

Ind., Indianapolis—FACTORY—Carpenter Steel Co., c/o general contractor, 1 story, 66x180 ft., brick, rein.-con., struc-tural steel factory addn., to Carl M. Geupel Constr. Co., 933 Hume-Mansur Bldg., $42,500, not plus. Bevington, Taggart & Fowler, 730 Indiana Pythian Bldg., engrs. Awarded 11/14.

Ind., South Bend—PLANT—Automotive Gear Div., Studebaker Corp., O. Klausmeyer, constr. engr., 631 S. Main St., 1 story, 60x250 ft., 1 story, 100x350 ft., and 1 story, 100x100 ft., brick, rein.-con. mfg. plant addns., railroad tracks and yard installa-tion, to Gus K. Newberg Constr. Co., 9 S. Clinton St., Chicago, Ill., $500,000, fixed fee. Giffels & Vallet, 1000 Marquette Bldg., De-troit, Mich., engrs. Awarded 11/14. CD 9/8—ENR 8/10.

Kan., Wichita — FACTORY — Southwest Tracker Co., 205 S. Wichita St., factory addn., to Vollmer Const. Co., 340 N. Main St., approx. $75,000. CD 11/8—ENR 11/16.

Mass., East Pepperell—WAREHOUSE—Dennis Bros. Bag Co., Chapel Pl., 1 story, 60x230 ft., brick warehouse, concrete fdn., to Granger Contg. Co., 394 Grafton St., Worcester. Est. over $40,000.

Mass., Hyde Park (sta. Boston)—MILL—Owner, c/o L. Fink, archt., 131 State St., Boston, 1 story, 63 x 175 ft., paper mill, brick, to A. Piotti Co., 730 Dudley St., Dor-chester. Est. $40,000. CD 11/17—ENR 11/23.

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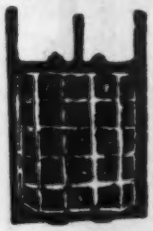

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INDUSTRIAL BLDGS. (Contracts Awarded Cont'd.)

Mass., Pittsfield—PLANT—General Electric Co., Plastics Div., Plastic Ave, brick steel, plant addn., to J. W. Bishop Co., 100 Foster St., Worcester. Est. over $40,000. Bids 11/10. CD 11/9—ENR 11/16.

Minn., St. Paul—PLANT—Minnesota Mining & Mfg. Co., 900 Fauquier St., general contract interior alterations, etc., plant, to W. M. Murphy & Son, at site, and 428 New York Bldg. Est. $60,000.

Minn., St. Paul—FACTORY—United Refrigerator Co., Chemical Div., A. Lampman, 2313 Wycliff St., general contract, 1 story, 53x222 brick, frame factory, to W. Backer, 5544 43 Ave. S., Minneapolis. Est. $70,000. W. R. Dennis, 1108 Nicollet Ave., Minneapolis, archt.

Mo., St. Louis—FACTORY—Century Electric Co., 1806 Pine St., Zone 3, 54 x 104 ft. and 36 x 89 ft., addnl. floor to present 1 story, brick, rein.-con. factory, 1812 Pine St., sub-contracts under supervision of Baylor Pendleton, archt., 408 Bd. Edw. Bldg., and Wm. B. Ittner, Inc., assoc. archts., 913 Locust St., Zone 1. Over $40,000 with equip.

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Mo., St. Louis—FACTORY—Hussmann Ligonier Co., 2401 North Leffingwell Ave., Zone 6, 1 story, 40x169 ft., brick factory addn., concrete fdn., 2832 Benton St., to Wm. H. & Nelson Cunliff Co., 3320 Lindell Blvd., Zone 3. Est. $40,000 with equip. C. Neff, 6324 West Florissant Ave., Zone 21, archt.

Mo., St. Louis—CREAMERY PLANT—Ar... Creamery Co., 4112 Papin St., Zone 10, 1 story, 59 x 140 ft. creamery plant addn., brick, concrete fdn., to Elam Contg. Co., 5436 Gravois Ave., Zone 16. Est. $40,000 with equip. J. Tarling, 4114 W. Kossuth St., Zone 15, archt.

N. J., Collingswood—MARKET, etc.—Food Fair, Inc., 2223 E. Allegheny Ave., Phila., Pa., 1 story food market and warehouse, separate contracts. $150,000. L. Kasoff, 2... E. Allegheny Ave., Phila., Pa., archt.

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N. C., Marion—FACTORY—Broyhill Furniture Co., E. A. Broyjill, Marion, in charge, repairing, altering mfg. bldgs., to Herman Sipe & Co., Conover, $40,000. H. Gaines, Asheville, archt.

O., Cleveland — FACTORY — Industrial Rayon Corp., H. S. Rivitz, pres., 9801 Walford Rd., 1 story, 31x49 ft., brick, steel boiler house, 1 story, 30x60 ft. chemical storage bldg., and aeration chamber addn. to sewerage sys., to George A. Rutherford Co., 2725 Prospect Ave. Est. $75,000. Wilbur Watson & Assoc., 4614 Prospect Ave., engrs.-archts.

O., Niles—FACTORY—Metal Products Co., J. P. Nerden, secy.-treas., Erie Ave., re... building factory, to Atlas Engrg. Co., Sa... Spring Rd., Youngstown. Est. $50,000.

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Pa., Phila.—PLANT—J. Ressman & Son, Inc., 1446 W. Main St., Norristown, mfg. plant, 244-254 S. 5 St., separate contracts. $60,000.

★ **Pa., Rouseville**—PLANT—Pennzoil Co., J. M. Hinman, in charge, Drake Bldg., Oil City, 1 and 2 story, brick, concrete bldgs., towers and tanks for methyl-ethyl-ketone solvent dewaxing plant, to Arthur G. McKee & Co., 2300 Chester St., Cleveland, O. Est. $1,400,000. CD 10/16—ENR 10/19.

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brick, hollow tile, concrete plant. Owner builds. $40,000. CD 9/27—ENR 10/5.

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Wis., Kewaunee—WAREHOUSE—Leyse Aluminum Co., Kewaunee, 1 story, 57 x 150 ft., brick, rein.-con. warehouse, to Kasper Constr. Co., 1203 N. 16 St., Manitowoc. F. Brandt, Dempsey Bldg., Manitowoc, archt.

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B. C., Kamloops—PLANT—Kamloops Ice & Cold Storage Co. Ltd., Kamloops, plant to J. C. Taylor & Co., Kamloops, about $100,000. R. Lyon, Penticton, archt. CD 11/7—ENR 11/9.

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Ont., Toronto—MACHINE SHOP, etc.—Dominion Wheel & Foundries Ltd., 171 Eastern Ave., 1 story, 50 x 140 ft., brick, concrete, steel machine shop addn., 171 Eastern Ave., to Carter Const. Co. Ltd., 19 Cherry St., about $50,000. James, Proctor & Redfern, Ltd., Excelsior Life Bldg., engrs.

Ont., Windsor — PLANT — Border Cities Dairy & Creamery Co., 636 Aylmer St., plant addn., to W. A. Hedrick, 1061 Oak Ave., $40,000. CD 9/15—ENR 9/21.

Ont., Windsor—PLANT BLDGS.—Ford Motor Co. of Canada, Ltd., 2780 Sandwich St. E., 2 plant bldgs., first aid room in foundry and laboratory in foundry, to Dinsmore-McIntire, Ltd., 903 Security Bldg., $7,000.

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Arkansas—POWER LINE—C & L Electric Cooperative, Monticello, 236.2 mi. power line, new Co. $188,960.

Arkansas and Louisiana — RAILWAY — Missouri Pacific R. R. Co., F. E. Bates, ch. engr., Missouri Pacific Bldg., St. Louis 3, Mo., 5 mi. track serving proposed Navy ordnance plant, near Camden, Ark., and connect with line between Gurdon, Ark. and Colliston, La. $25,000.

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Conn., Naugatuck—LATEX TANKS—Naugatuck Chemical Div., U. S. Rubber Co., Elm St., soon lets contract, concrete latex tanks, Fletcher Thompson, Inc., 111 State St., Bridgeport, engr.

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Features of the new edition

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—illustrative design of a typical beam-and-girder floor system, showing sketches of the reinforcement, arrangement of bars at the junction of continuous beams over a column, and approximate methods of determining where to stop or bend longitudinal reinforcement
—treatment of combination of columns and pipe columns filled with concrete
—practical suggestions for the construction of long retaining walls with varying heights
—useful material for the design of rectangular spread footings with direct loads and overturning moments

This book gives the engineer extremely practical material in examples of design problems and constructional data taken from actual structures such as the Lincoln Tunnel, The George Washington Bridge, the Bayonne Bridge, etc., with which the author has had close association.

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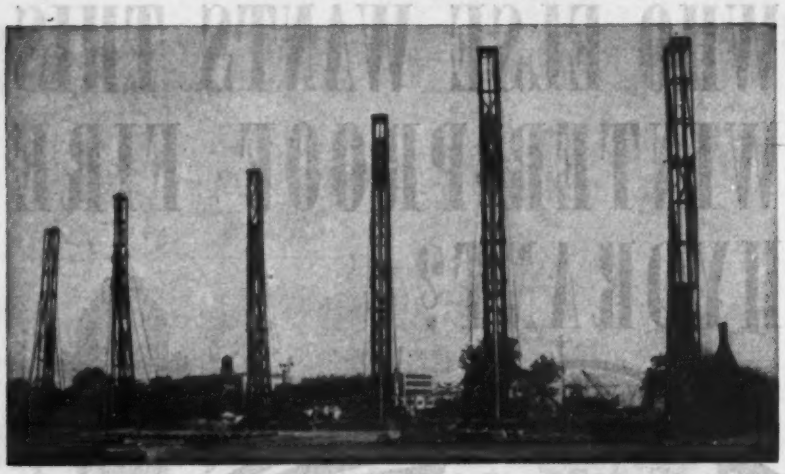

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Mass., Pittsfield—PLANT—General Electric Co., Plastics Div., Plastic Ave., brick steel, plant addn., to J. W. Bishop Co., 109 Foster St., Worcester. Est. over $40,000. Bids 11/10. CD 11/9—ENR 11/16.

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—practical suggestions for the construction of long retaining walls with varying heights
—useful material for the design of rectangular spread footings with direct loads and overturning moments

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UNCLASSIFIED (Proposed Work, Cont'd.)

Indiana — SERVICE EXTENSIONS—Hendricks County Rural Electric Membership Corp., Danville, service extens., Hendricks Co. $40,000.

Indiana—SERVICE EXTENSIONS—Morgan County Rural Electric Membership Corp., Martinsville, service extens., Morgan Co. $30,000.

Maine—TRANSMISSION LINES—Denny's River Electric Coop., Inc., Meddybemps, 40 mi. transmission lines, rehabilitation and integration 12 mi. existing line, Washington Co. $99,000.

Missouri — SERVICE EXTENSIONS — Ozark Electric Cooperative, Mount Vernon, service extens., Lawrence Co. $75,000.

Ia., Charles City—AIRPORT—City, N. E. McRobert, mayor, City Hall, approved $60,000 bond issue airport. CD 10/24—ENR 10/26.

Ia., Perry—AIRPORT—City, M. E. Jenkins, mayor, City Hall, approved $50,000 bond issue airport. CD 10/20—ENR 10/26.

Ia., Washington—AIRPORT—City, R. L. Lytle, mayor, airport. $50,000.

Kan., Beloit—AIRPORT—City, H. E. Heidrick, mayor, City Hall, approved $35,000 bond issue, airport. CD 10/24—ENR 10/26.

Kan., Marysville—AIRPORT—City, H. A. Hohn, clk., City Hall, approved $50,000 bond issue, airport. CD 10/10—ENR 10/12.

†**La., Camp Polk**—SPRINKLER SYSTEM —U. S. Eng., 25 St. and Avenue F, Galveston, Tex., indefinitely postponed bids to have been opened Nov. 18, installing automatic sprinkler sys. in laundry bldg., Solic. 41-243-45-C-39.

Mass., Norwood and Canton—AIRPORT—E. W. Wiggins Airways, Inc., Norwood, preliminary plans airport expansion, incl. land work, bldgs., etc. Over $25,000. H. J. Korslund, 153 Nahatan St., Norwood, archt.

Missouri—RURAL ELECTRIC LINES—Farmers' Electric Co-Operative, Chillicothe, 92 mi. rural electric lines, Caldwell and Carroll Counties, $75,000 REA allot.

Missouri—RURAL ELECTRIC LINES—Genevieve Electric Cooperative, Inc., T. A. Carron, pres., Ste. Genevieve, approx. 75 mi. addnl. rural electric lines in Perry and Ste. Genevieve Counties. Michael Drazen & Associates, 4902 Delmar Blvd., St. Louis, Zone 8, engrs.

Missouri — ELECTRIC LINES — Howell-Oregon Electric Cooperative, West Plains, electric lines, Howell and Oregon Counties, $25,000. REA.

Missouri—RURAL ELECTRIC LINES—North Central Missouri Electric Cooperative, Milan, rural electric lines, Lincoln, Warren, Montgomery and St. Charles Counties, $25,-000. REA.

Missouri—ELECTRIC LINES—Ozark Electric Co-Operative, Mount Vernon, 70.3 mi. electric lines, Barry, Greene, Lawrence, Polk, Stone and Webster Counties, $75,000. REA allot.

Mo., Overland (P. O. St. Louis)—PARK—City, c/o City Clerk, St. Louis, Zone 14, defeated $120,000 bonds, acquisition of site and development city park, incl. recreational facilities, etc. $120,000 plus. CD 10/13—ENR 10/19.

Mo., Nevada — AIRPORT — City, L. M. Ewing, mayor, voted $30,000 bonds, airport.

Nebraska—TRANSMISSION LINES—Norris Rural Public Power Dist., Lincoln, 85 mi. transmission lines, Lancaster Co. $85,000.

O., Canton—GAS PIPELINE—East Ohio Gas Co., G. Horsley, in charge, 1405 E. 6 St., Cleveland, making plans installing 4¼ mi. 8 in. steel gas pipeline, J. F. Gray, 1405 E. 6 St., Cleveland, engr.

Pa., Neville Island (br. Pittsburgh)—ELECTRICAL DISTRIBUTION SYSTEM—Dravo Corp., Neville Island, rehabilitating electric distr. sys. $64,000.

★**Texas and Mexico**—PIPELINE CARRIER—Reynosa Pipe Line Co., Reynosa, State of Tamaulipas, Mexico, 160 mi. 14 in. natural gas pipeline carrier (40,000,-000 cu. ft. daily capacity) between Weslaco, Tex., and Monterrey, Mexico, $1,250,000.

Tex., Arlington—RIFLE RANGE, etc.—Bd. Educ., City Hall, Fort Worth, R.O.T.C. rifle range, storage bldg. $50,000. P. M. Geren, 806¼ Burnett St., Fort Worth, archt.

Tex., Houston—GAS LINES, etc.—Jno. F. Scott, Commerce Bldg., natural gas lines and grounds development for 310 acre subdivision. $25,000.

Tex., Houston—BOWLING ALLEY—A. K. Stone, archt., Electric Bldg., soon lets contract, 1 and 2 story, 122x148 ft., steel frame, brick, hollow tile, concrete bowling alley, for River Oaks Corp., River Oaks Blvd. $50,000.

Washington—PROTECTIVE SIGNALS—Spokane, Portland & Seattle Ry. Co., A. J. Witchel, ch. engr., 1101 N.W. Hoyt St., Portland, Ore., independent protective signals at 35 stations between Vancouver and Spokane, $426,398.

★**W. Va., Belle**—WATER GAS GENERATOR REPLACEMENT—E. I. Dupont de Nemours & Co., 100 Market St., Wilmington 98, Del., replacing 6 water gas generators with S.V.G.I. Gen. Model B generators. $785,000.

Alta., Acme — ELECTRIFICATION — Calgary Power Co. Ltd., Calgary, electrification scheme for town. $35,000.

N. S., Canning—DYKE—Habitant Marsh Co. Ltd., Canning, dyke and aboiteau over Habitant River. About $100,000.

N. S., Kentville—Habitant Marsh Co. Ltd., Kentville, dyke. $30,000.

Ontario—TRANSMISSION LINES—Hydro-Electric Com. of Ontario, University Ave., Toronto, rehabilitating transmission lines in villages of Caledon, Erin, Alton and Inglewood. $40,000.

Ont., Cornwall — RADIO STATION — Standard-Freeholder Ltd., Cornwall, radio station, broadcasting studio, transmitter house, tower, etc. $50,000.

Ont., Fort Erie—ARENA, etc.—Fort Erie Parks Comn., Fort Erie, arena and artificial ice plant. $40,000.

Ont., Orillia — RADIO STATION — Bd. Trade, c/o G. Smith, Orillia, radio station. $50,000.

★**Ont., Sarnia**—TRANSMISSION LINE—Sarnia Hydro-Electric Comn., Sarnia, installing addnl. 110,000 volt transmission line to serve city. About $600,000.

Ont., Toronto—PARKING LOTS—Adelaide-Pearl Parking Ltd., E. G. Black, 49 Yonge St., automobile parking lots. $40,000.

Ont., Toronto—STREET SIGNS—Municipality, illuminated street signs throughout city. $50,000. A. Harris, City Hall, works comr.

Que., Hull—SWIMMING POOL, etc.—L. Grattow, 38 Aylmer Rd., 3 story, 50x150 ft. bldg., incl. swimming pool, roller skating rink and bowling alley. $100,000.

Que., Quebec City—PARK IMPROVEMENTS—Province of Quebec, Quebec City, completing park imprvs., Mount Orford Natl. Park, $100,000. Dpt. Game & Fisheries, Quebec City, engr.

Que., Sherbrooke—RACE TRACK, etc.—Syndicate, c/o E. Blouin, 24 W. King St., race track and grandstand on Collins Farm, facing Lord Sherbrooke Camp. $50,000.

Sask., Saskatoon—STREET LIGHTING SYSTEM—Municipality, imprv., street lighting sys. $30,000.

Washington — SERVICE EXTENSIONS — Chelan County Electric Cooperative, Inc., Leavenworth, service extens., Chelan Co. $40,000.

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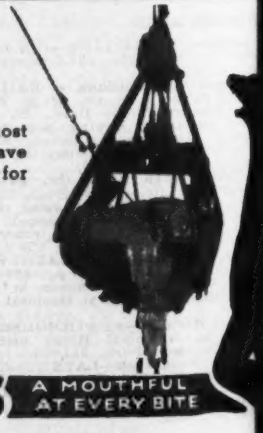

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Washington—TRANSMISSION LINE, etc. Public Utility Dist. 1 of Douglas Co., Waterville, 134 mi. transmission lines, rehabilitation of 58 mi. existing line, Douglas Co. $250,000.

Wash., Seattle — LANDING SYSTEM — Civil Aeronautics Admin., Smith Tower ding, Zone 4, indefinitely postponed bids ich have been opened Nov. 21, instrument nding sys., at Bow Lake Airport, Proposal 44-154. CD 11/13.

DS ASKED

Bids Asked After November 28

N. M., Kirtland Field (br. Albuquerque) —WIDENING TAXIWAYS, etc.—U. S. g., 4 and Gold Sts., Albuquerque, widen- taxiways, building earthen shoulders, 4,000; access taxiways, $190,000; hangars, 5,000; exten. aprons, $325,000; navy ner bldg. $60,406. CD 11/9—ENR 11/16.

Bids Asked After December 1

Texas — PIPELINE CARRIER — Dow Chemical Co., Freeport, and M & M dg., Houston, laying 79 mi. 4 in. steel eline carrier to move liquefied petroleum s, starting near Katy going to Freeport. $700,000. CD 11/24.

Tex., Galveston—RADIO RANGE STA- ON—Civil Aeronautics Admin., P. O. Box 0, Fort Worth, Zone 1, ML radio range ation. Plans deposit $10.

Bids Asked December 6

Ga., Fort Benning — AUTOMATIC PRINKLER SYSTEMS—U. S. Eng., Grant west of Westwood St., Mobile, Ala., auto- tic sprinkler sys. in Laundries 234, 240 and and in Shops 258, 259, and 260, Ser. 46.

La., Shreveport—TENNIS COURT—R. H. lle, supt. Caddo Parish School Bd., rthouse Bldg., concrete tennis court on nton School grounds.

Bids Asked December 7

Missouri—RURAL ELECTRIC LINES— nevieve Electric Cooperative, Inc., T. A. ron, pres., Ste. Genevieve, approx. 135.3 rural electric lines, Project Missouri 58 Genevieve, incl. 2 separate sys. with 1 nsformer substation for each, Perry and Genevieve Counties. Michael Drazen & sociates, 4903 Delmar Blvd., St. Louis, o 8, engrs. C. 5/12—ENR 5/18.

Bids Asked December 8

Tex., Randolph Field—RUNWAYS, etc. —U. S. Eng., Fort Sam Houston, exten. existing parallel northwest-southeast ways from 5,500 ft. to 7,000 ft.; conting 75 ft. wide occasional-use shoul- s on each side of 2 runways; widening 4 ways at each end of northwest-south- runways to 100 ft.; constructing 75 ft. taxiways, along outer edge of 2 exist- asphalt aprons; new heavy-duty con- te apron approx. 240,000 sq. yd. on south of airfield incl. access taxiways and ft. shoulder, night lighting sys., grass certain areas, relocation of roads and avating control tower, etc. CD 11/16— R 11/22.

Bids Asked December 15

N. Y., Bear Mountain—TREE REMOVAL Palisades Interstate Park Comn., Administration, Bear Mountain State Park, re- ving approx. 723 damaged by hurricane; . ENR 11/30.

W BIDDERS

California—RUNWAY FILL—U. S. Eng., New Montgomery St., San Francisco, Zone rock face along runway fill at San ncisco Airport, Spec. 1530-1, San Mateo from P. Sorensen, 927 Arguello St., lwood City, $63,000.

Calif., McClellan Field — AUTOMATIC RINKLERS—U. S. Eng., 1209 8 St., ramento, Zone 8, automatic sprinklers in torage bldgs., Spec. 894, from MacDonald Kahn Inc., 200 Financial Center Bldg., Francisco, $242,928.

Fla., Boca Raton—AIRFIELD BLDGS. —U. S. Eng., 512 Spring St., Atlanta, Ga., 14, 2 school bldgs. and officers quarters, Algernon Blair, First National Bank ., Montgomery, Ala., $649,435. CD 9/22 NR 9/28.

Ga., Atlanta—SPRINKLER SYSTEM—U. ng., Post Office Bldg., Savannah, auto- ic sprinkler sys. for open sheds and rmediate decks in warehouse, Ordnance ot, ADD. 13-45, from Automatic Sprinkler . of America, 161 Spring St. N.W., $76,- CD 11/8.

Ga., Savannah—AUTOMATIC SPRINK- SYSTEM—U. S. Eng. Post Office Bldg., 17, automatic sprinkler sys. for ware- es, at A.S.F. Depot, from Crawford & en, 338 Woodrow St., Atlanta, $150,950. 11/3.

Ore., Hermiston—SPRINKLER SYS- —U. S. Eng., 628 Pittock Block, S.W. ve. and Washington St., Portland, Nov. rnishing, installing 6 automatic sprin- sys. in 6 warehouses at Umatilla Ord- ce Depot, from Viking Automatic Sprin- Co., 811 N. W. Davis St., Portland, 302.

Tex., Kelly Field (br. San Antonio)— OPED NATURAL GAS LINE SYSTEM—

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UNCLASSIFIED (Low Bidders, Cont'd.)

U. S. Eng., Fort Sam Houston, Nov. 22,500 lin. ft. 4 to 6-in looped natural gas for Air Depot Area, Ser. No. W-41-1 45-45, from M. B. & M. Pipe Co., 1 Ruiz St., Houston, $25,281. CD 10/25.

Tex., Houston—COLISEUM—City, M. Westerman, secy., City Hall. Nov. 23, w coliseum, concrete fdn., from Telle Constr. Co., 3900 Clay Ave., $23,380. 11/13.

†**Va., Dahlgren**—BOMBING TARGET, —Yards & Docks, Navy Dpt., 18 St. Constitution Ave. N.W., Wash. 25, D. Nov. 32, concrete bombing target and acc road, NOY 10759, from Doyle & Russ Central Natl. Bank Bldg., Richmo $169,865; 18 in. gun emplacement, N 11183, from Industrial Engrg. Co., Church St., New York, N. Y., $166,866, b at Naval Proving Ground. CD 11/15.

Vt., Rutland—HANGAR—City, G. M Laughlin, chn. Airport Comn., City H steel, frame hangar, municipal airport, fr C. G. Noyes, 21 Center St., $40,832. CD 11/ —ENR 11/16.

†**Wash., Port Orchard**—PLAYGROUND Pub. Housing Auth., NHA, Skinner Bldg., Ave. and Union St., Seattle, Zone 1, No 11, 3 playgrounds at housing, from Th burn & Logozo, 4608 36 Ave. SW, Seatt $37,000.

CONTRACTS AWARDED

†**Ariz., Marana** — AIR FIELD WAR HOUSES—U. S. Eng., 751 S. Figueroa S Los Angeles 14, Calif., reconstructing war houses at Marana Army Air Field, No. 9 to Bridgeman Constr. Co., P. O. Box 14 Yuma, $33,530. Bids 11/8.

★†**Calif., Port Chicago**—PIER, etc.—Ya & Docks, Navy Dpt., 18 St. and Cons tution Ave. N.W., Wash. 25, D. C., 2-ber pier, facilities, Naval Magazine, NO 11179, to Mercer, Fraser Co., 83 McAlles St., San Francisco, $900,542. CD 11/2, un LB.

Calif., Wilmington — WHARF — Consol dated Shipyard, Inc., Wilmington, timb wharf at Berth 219, to Warren-Southwe Inc., P. O. Box 386, $30,000.

★**Calif., San Diego**—WIND TUNNEL, —Consolidated Vultee Aircraft Cor 3302 Pacific Hy., wind tunnel and aer nautical laboratory, at Lindbergh Field, Austin Co., 777 E. Washington Blvd., L Angeles, $524,000. CD 5/24—ENR 6/1.

†**Fla., Boca Chica**—AIR STATION BLDG —Yards & Docks, Navy Dpt., 18 St. a Constitution Ave. N.W., Wash. 25, D. addnl. bldgs., Naval Auxiliary Air Statio NOY 10008, to John H. Mann & Son, 27 N.W. 17 Ave., Miami, Zone 37, $99,018.

Mass., Worcester—RADIO BROADCAS ING FACILITIES—Harry Davidson & So archts., 50 Beacon St., Boston, impry. ra broadcasting station facilities for W.A.A 340 Main St., to J. B. Lowell, Inc., 173 Gro St. Est. $35,000. Bids 10/25. CD 10/24.

†**Neb., Harvard**—AIRFIELD BLDGS., —U. S. Eng., 1709 Jackson St., Omah airfield bldgs., incl. miscellaneous work, Contr. W-25-066-eng-640, to Korshoj Cons Co., Blair, $35,756; addnl. utilities, w pump and roads, Contr. W-265-066-eng-6 to Otto B. Ashbach & Sons, 2700 Hamil Ave. N., St. Paul, Minn., $36,822, both Harvard Army Airfield.

†**Neb., McCook**—AIRFIELD BLDGS., —U. S. Eng., 1709 Jackson St., Omaha, field bldgs., incl. miscellaneous work, Mc Cook Army Airfield, Contr. W-25-066-en 642, to Sioux Contractors No. 4, 700 Fir Exchange Bldg., Minneapolis, Minn., $ 642. CD 11/13—ENR 11/16

†**N. Y., Binghamton**—SPRINKLER SY TEM—U. S. Eng., 120 Wall St., New Yo Zone 5, automatic sprinkler protect Binghamton Medical Depot, Contr. W-3 075-eng-2418, to Automatic Sprinkler Co of America, Brittain St., Youngstown, est. $143,749. Bids 10/31. CD 10/17—E 10/19.

†**N. Y., Malone**—AIRPORT DRAINAGE U. S. Eng., 120 Wall St., New York, Zone drainage at Malone Airport, to Louis Lon & Son, Glens Falls, $51,445.

†**N. Y., Romulus**—SPRINKLER SYSTE —U. S. Eng., 120 Wall St., New York sprinkler sys., to Viking Sprinkler Co., Vesey St., New York, Zone 7, $4 Bids 11/2. CD 10/10—ENR 10/12.

North Carolina—AIRPORT GRADING, —Morganton and Lenoir City Bds., Com and Airport Com., Morganton, grading, sur facing, constructing protecting berm an pipe draining area at airport Morgan and Lenoir, to Kiker & Yount, Reidsv $43,000. Bids 10/27. CD 11/8—ENR 11/16

★†**N. C., Cherry Point (br. New Bern**) **AIR STATION BLDGS.**—Yards & Doc Navy Dpt., 18 St. and Constitution Av N.W., Wash. 25, D. C., addnl. facili bldgs. Atlantic Outlying Field, to V. P. L tis, Builders Bldg., Charlotte, $ addnl. facilities, bldgs., Atlantic and Be Outlying Fields, to C. H. Tompkins C 907 16 St. N.W., Wash., D. C., $ Naval Air Station, NOY 10349. CD 1 under LB—ENR 9/14.

CLASSIFIED (Contracts Awarded, Cont'd.)

...N. C., Oak Grove (Pollocksville)—AIR-...FIELD IMPROVEMENTS—Yards & ...ks, Navy Dpt., 18 St. and Constitution ...N.W., Wash. 25, D. C., airfield imprvs., ...officers quarters, mess halls, miscellan-...bldgs. Auxiliary Air Field, Spec. 14763, ...NY 16351, to V. P. Loftus, Builders Bldg., ...rlotte, $514,000. Low Bidder permitted to ...hdraw bid because of error. CD 11/14 ...er LB-ENR 4/27.

..., Cleveland—TANKS—Ohio Forge & ...shine Co., S. C. Dalbay, pres., 3410 Wood-...Rd., 4 steel tanks, total cap. 50,000 gal., ...ft. retaining wall, 18 ft. high to H. L. ...ns Co., 5300 Chester Ave. Est. $50,000.

..., Patterson Field (br. Fairfield)—AIR-...LD BLDG.—U. S. Eng., Wright Field, ...bldg. and clinic, Contr. W-33-046-...-164, to H. W. Miller, Covington, Ky., ...,726.

..., Oklahoma City—SPRINKLER ...EMS—U. S. Eng., Oklahoma City, con-...ing automatic sprinkler sys., Tinker ...d, Contr. W-34-066-eng-205, to Rock-...d Sprinkler Co., Audubon Bldg., New ...ans, La., est. $194,248.

...ve., Astoria — GUNNERY RANGES — ...ks & Docks, Navy Dpt., 18 St. and ...stitution Ave. N.W., Wash. 25, D. C., ...floor gunnery ranges and radar beacon ...er, Naval Air Station, NOY 11386, to ...Hellstrom, 649 Jerome Ave., Astoria, ...,729.

..., I., Quonset Point—SALVAGE YARD— ...ks & Docks, Navy Dpt., 18 St. and ...stitution Ave. N.W., Wash. 25, D. C., ...age yard, Naval Air Station, NOY 10168, ...Coleman Constr. Co. and H. V. Collins, ...Turks Head Bldg., Providence, $47,000. ...d 11/16. CD 11/2.

...xas—RURAL ELECTRIC POWER ...NSMISSION LINES—Stamford Electric ...Operative, Stamford, 53 mi. rural elec-...power transmission lines, Jones Co., ...Stovall Constr. Co., Sherman, $35,000. ...e & Nichols, 407 Cappa Bldg., Fort ...th, engrs. CD 9/22—ENR 4/6.

...Texas—SPRINKLER SYSTEMS—U. S. ..., Fort Sam Houston, 3 sprinkler sys., ...all piping, etc., in Camps Hood, Swift ...Bowie, to Texas Automatic Sprinkler ...1239 Milam Bldg., San Antonio, $36,646.

...x., Beaumont — STORAGE TANKS — ...nolia Petroleum Co., Beaumont, 3 steel ...ge tanks, own forces. $75,000. CD ...—ENR 11/9.

...x., Fargo — PIPELINE EXTENSION — ...-Western Corp., Wichita Falls, 4½ mi. ...line exten., own forces. Approx. $80,000.

...x., Houston—LOADING DOCK, etc.— ...Iron & Steel Co., 700 N. San Jacinto ...steel, concrete loading dock and freight ...tor, to American Constr. Co., Rusk ..., approx. $48,000.

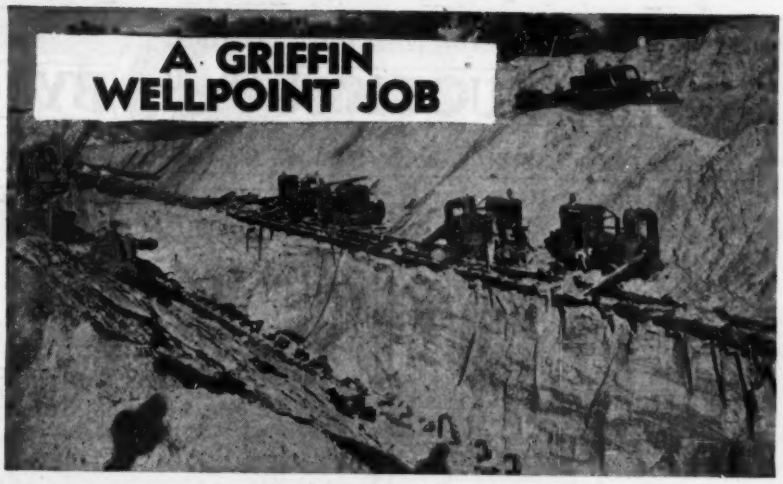
...x., Laredo—GUNNERY RANGE—U. S. ..., Fort Sam Houston, addnl. gunnery ...facilities, to Cunningham & Dinn, ...N. St. Mary's St., San Antonio, $29,499.

...tah, Ogden—APRONS—U. S. Eng., 1209 ..., Sacramento 8, Calif. reconstructing ...rete aprons, Contr. W-04-167-eng-665, ...n Arsenal, near here, to Chytraus ...tr. Co., 436 S. 4 West St., Salt Lake ...$47,625.

...tah, St. John — LOADING DOCKS — ... Eng., 630 S. State St., Salt Lake City, ...ng docks at Deseret Chemical plant, to ...on Constr. Co., 1172 E. South Temple ...Salt Lake City, $38,475. Bids 11/15.

...ash., Seattle—TRACK MOVING, etc.— ... Northern Ry. Co., C. M. Nye, ch. ..., 175 E. 4 St., St. Paul, Minn., moving ..., grading, paving, near King St. Sta-... to M. P. Butler 3419 13 Ave. S.W. ...$30,000.

Proposal Advertisement see p. 162
Postwar Projects see p. 120



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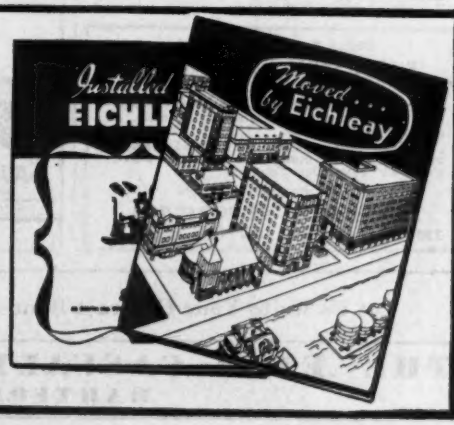

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OFFICIAL PROPOSALS

Bids: Dec. 13 (324)

36" Water Pipe and Fittings

DEPARTMENT OF PUBLIC WORKS
CITY OF CHICAGO

Chicago, November 28, 1944.

SEALED PROPOSALS will be received by the City of Chicago for furnishing and delivering on streets in the City of Chicago located on Wabansia Avenue from Newland Avenue to Cicero Avenue; and on Mason Avenue from Wabansia Avenue to North Avenue, approximately 15,000 feet of 36-inch Water Pipe and Special Connection Fittings for same until 11 A. M. (C.W.T.) on Wednesday, December 13, 1944, at Room 406, City Hall, Chicago, Illinois, at which time and place all bids will be publicly opened and read aloud. Each bid must include Bill of Material "D".

The successful bidder will be required to furnish a satisfactory Performance Bond.

The contract documents, including specifications, known as City Specification 89-44, Federal Works Agency Project, No. Ill.-11-331-N are on file at the office of the Commissioner of Public Works of the City of Chicago, Room 406, City Hall.

Proposals must be made out in triplicate upon blanks furnished at said office and be addressed to said Department, endorsed "Proposal for 36-Inch Water Pipe and Fittings", and be accompanied with Five Thousand Dollars ($5,000.00) for the complete job, in money or a certified check for the same amount on some responsible bank.

The Commissioner of Public Works reserves the right to reject any and all bids and to award the contract to the bidder whose Proposal he deems most advantageous to the City; and to waive any and all formalities.

No proposal will be considered unless the party submitting the same shall furnish evidence satisfactory to the Commissioner of Public Works of ability, and the possession of the necessary facilities, together with sufficient pecuniary resources, to fulfill the conditions of this contract and specifications.

No bid shall be withdrawn for a period of thirty days after the scheduled time for receiving and opening bids.

CITY OF CHICAGO
By: Oscar E. Hewitt
Commissioner of Public Works.

Bids: Dec. 15 (325)

Removal of Trees

Sealed bids will be received by the Palisades Interstate Park Commission at their office, Administration Building, Bear Mountain State Park, Bear Mountain, New York, and publicly opened and read at 2:00 P.M. Friday December 15, 1944, for the removal of approximately 723 trees damaged by hurricane. Proposal and specifications can be obtained by addressing the Palisades Interstate Park Commission, Bear Mountain State Park, Bear Mountain, New York. The Commission reserves the right to reject any and all bids received.

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